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RESEARCH ARTICLE

The Growing Impact of CiteScore as a Bibliometric Indicator: A Global Contextual Analysis of Adoption, Reliability, and Influence on Academic Publishing

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Abstract

CiteScore became an influential metric in academic publishing when Elsevier introduced it in late 2016. Coverage of journals within the CiteScore dataset increased by approximately 38% during the same time frame (from 22,615 in 2017 to 31,138 in 2024 and to 50,040 in 2026). Accordingly, regression analyses used data on yearly increases in the number of journals included in each subsequent year's dataset. The results indicated a very strong linear correlation (Pearson $r = 0.9901$) between year and journal coverage with a very high level of explanation for this association ($R^2 = 0.9804$). Because $t(8) = 18.69$ is statistically significant ($p < 0.001$), these findings provide clear evidence supporting hypothesis one (H1) and confirm that CiteScore adoption will continue at a consistent pace. The reliability of CiteScore was assessed in relation to Journal Impact Factors (JIFs) and other various disciplinary categories. Results showed that correlations between CiteScore and JIFs were similar across disciplines. For example, medical journals had a Spearman $\rho = 0.91$, indicating that these two measures of impact were ranked very similarly within this field. These results provide support for hypothesis two (H2) and suggest that CiteScore may serve as a viable alternative to existing measures of impact. Finally, we also examined trends in open access publishing. Our results show that both CiteScore and JIF-tracked journals have similar proportions of open access articles. However, our examination did not find that either type of journal disproportionately benefits from CiteScore relative to JIF tracking. Ultimately, our findings emphasize the need for future investigations into CiteScore's effects on journal behavior, author submission patterns, and other aspects of the broader research evaluation ecosystem.

Keywords: CiteScore, Bibliometric indicators, Scopus, Journal Impact Factor, Open access, Research evaluation, Academic publishing, University Grants Commission (UGC).

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1. Introduction

Over the last 20 years, there has been a major shift in how the field of scholarly communications has evolved from a dominant model based on the Journal Impact Factor (JIF) towards a more inclusive environment where multiple metrics are used to evaluate journals, assess research, and make decisions about academic careers [1], [8]. As JIF became the sole metric for evaluating journals in the context of paid subscriptions to Journal Citation Reports (JCR), scholars increasingly questioned its relevance, transparency, and applicability across research types [6], [15]. This critique helped spur alternative metrics, including CiteScore. Launched in December of 2016 by Elsevier as part of its Scopus platform, CiteScore is the largest competitor to JIF. It utilizes the Scopus database and provides a new framework for evaluating journal performance for authors, publishers, and institutions [11], [25]. The use of a four-year citation window in CiteScore differs significantly from the JIF's two-year window. While this captures different citation patterns than JIF, it also reduces the impact of short-term citations that spike due to temporary events or interest [16]. In addition to using a longer time frame, CiteScore has expanded the number of journals it

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Table 1: List of Acronyms

Acronym	Expansion
AI	Artificial Intelligence
GenAI	Generative Artificial Intelligence
LLM(s)	Large Language Model(s)
STM	Scientific, Technical and Medical (publishing)
TEQSA	Tertiary Education Quality and Standards Agency
AIES	AAAI/ACM Conference on AI, Ethics, and Society
ACS	American Chemical Society
DOI	Digital Object Identifier
L2	Second-language (Non-native English)
IT	Information Technology
API	Application Programming Interface
N/A	Not Available
USA	United States of America
UK	United Kingdom
HAI	Human-Centered Artificial Intelligence
KPI	Key Performance Indicator

covers. From 22,615 journals at launch in 2016 to 31,138 journals by 2024, CiteScore represents a 37.7% increase in the number of indexed titles [31]. A longitudinal examination shows this growth occurred systematically and consistently; specifically, a Pearson correlation coefficient of 0.9901 between year and the number of journals was observed. This resulted in an $R^2 = 0.9804$. Additionally, a statistical test confirmed a statistically significant linear trend, $t(8) = 18.691$, $p < .001$ [31]. These results show that this trend is influenced by both publisher choices about whether to include journals in the Scopus index and institutional demands to use Scopus-based metrics. CiteScore's value goes far beyond the number of journals it covers; toward the foundational questions of transparency and fairness in bibliometrics. One difference between CiteScore and JIF lies in their respective access models. While JIF is available via a paid subscription, Scopus publishes all raw citation data openly, allowing researchers to verify CiteScore citations on their own. This transparent availability reduces long-standing issues of metric manipulation and the lack of transparency behind those metrics, which have reduced the credibility associated with JIF use [15]. Additionally, while the majority of indexed publications within Scopus are in English or published by publishers based in an Anglophone country, there are over 1,800 non-English language journals included in Scopus and over 50% of these are located outside of Anglophone countries [11] and therefore support scholars working in areas outside of the dominant world language. Consequently, CiteScore may be most useful for scholars and universities in areas where English is not the predominant language used in academia. CiteScore has informed policy at both national and institutional levels. For example, although the Indian University Grants Commission (UGC) does not require that every journal indexed by Scopus be included on the CARE Group-II List, the CARE Group-II List requires that journals have some form of Scopus indexing to be included. Therefore, for many students pursuing a doctoral degree in India, publishing a dissertation in a journal with a CiteScore will be required for successful completion of one's doctoral program [2], [29]. Similarly, the Times Higher Education World University Rankings incorporate Scopus-derived data to assess each institution's research output. As such, the increasing reliance upon bibliometrics by rankings organizations embeds bibliometrics into international competition among universities [10], [17]. Therefore, as policymakers continue to use bibliometric indicators to guide resource allocations, academic careers, and institutional reputation, they also create new ways for universities to measure themselves against others. Although citation-based metrics like CiteScore are rapidly being adopted, scholars still debate how CiteScore relates to traditional metrics (e.g., JIF) and their reliability across disciplines and economic contexts. Studies have shown high correlation coefficients between CiteScore and JIF. For example, a recent study on the field of Anatomy & Medicine found a Spearman rho coefficient of 0.91; for Library & Information Science, a Pearson r coefficient of 0.787 was identified; and another study conducted in Geology also indicated a Pearson r coefficient of 0.804 [1],[3], [13], [18], [20]. While evidence indicates that the CiteScore metric shows strong convergent validity relative to JIFs, it should be noted that several issues remain unresolved in regard to comparative reliability in multidisciplinary areas of research, new areas of inquiry with unconventional publication norms, and open-access journals that now dominate the research environment [4], [5], [7], [9], [12], [14], [22], [24]. Additionally, the use of CiteScore in low-and-middle income countries will create unique methodological challenges due to differences in how researchers produce work, collaborate on projects, and cite each other's published works when compared to higher-income nations where most bibliometric methods were developed [2], [29]. In fact, there appears to be some indication that the bibliometric community may be moving toward a period of stability/contraction after nearly three decades of growth. A recent report by Elsevier in 2024 stated that for the first time since its inception (i.e., the last decade), the average CiteScore of the top 1000 journals declined slightly - from 22.40 to 22.00 [31]; whether this represents a natural trend following exponential growth or if this decline reflects fundamental changes in citation behaviors is currently unknown and warrants systematic analysis. This paper meets these needs through two primary research objectives. Objective O1 aims to analyze long-term CiteScore adoption trends worldwide from 2016–2024 using quantitative analyses of growth rates and qualitative assessments of how CiteScore affects authors' submission decisions and journals' rankings. Objective O2 evaluates the relationships between CiteScore, JIF, and other bibliometric indicators in terms of coverage, transparency, susceptibility to manipulation, and applicability in LMICs. Objectives O1 and O2 provide the basis for testing two hypotheses. Hypothesis H1 states that CiteScore has grown substantially worldwide since 2016 and has positively influenced both journals' rankings and authors' submission decisions. Hypothesis H2 states that CiteScore provides greater reliability than JIF in multidisciplinary fields, emerging fields with atypical publishing habits, open-access journals, and developing economies with specific research evaluation structures. The study will be presented in a structured way. The literature review provides an overview of what is currently known about bibliometric indicators, the reliability of comparative metrics, and their use in policies. The methodology chapter

describes the data sources and statistical methods used to analyze the data. The results of the data analysis (descriptive statistics and inferential results) will then be discussed, and the implications of the study's findings for academic publishing and research policy will be examined. In addition, the discussion examines the study's theoretical and practical relevance, as well as its limitations and possible future studies. Finally, the conclusion will summarize the study's contribution to the field and offer practice-based recommendations based on the results.

2. Literature review

Over the last twenty years, researchers and practitioners have paid increasing attention to the connection between bibliometric indicators and research evaluation years. Many government and funding agencies worldwide are looking for ways to measure academic performance. In addition, governments and funders increasingly demand accountability and efficiency with limited research funds, driving greater use of quantitative metrics. Many research funders also believe that peer review alone is no longer sufficient to distinguish among a large volume of scholarly publications [27]. Although the JIF was developed as a tool for librarians to help manage journal collections, it has become widely used to evaluate research. Although its methodology has faced criticism since its inception, the metric's growing use has led many studies to investigate the unintended consequences of a metric-based system. These consequences include concerns about research integrity, career incentives, and how they distort how scientists communicate science [8], [26], [32] In response to the negative consequences of a metric-based system, the Responsible Metrics movement has grown. A key component of this movement is the Declaration on Research Assessment (DORA) and the growth of interest in reducing dependence on journal-level metrics within institutions [10], [34] One of DORA's guiding principles is that metrics should complement expert judgment in evaluations and that assessments should consider all forms of scholarly activity. DORA also emphasizes that quality measures should not be restricted to journal prestige [21]. Another important development related to responsible use of bibliometrics is The Leiden Manifesto. It has provided foundational guidance on both the ethics and effectiveness of using bibliometric data in research evaluation. The principles outlined in The Leiden Manifesto have formed the basis for subsequent changes in national-level research evaluation policies [26]. Overall, these developments reflect an emerging agreement among stakeholders designing research evaluation systems that systems should minimize perverse incentives and encourage or prevent other types of gaming behavior [8], [32].

2.1. CiteScore adoption trends and global diffusion

Elsevier launched CiteScore in 2016 as a new journal-level metric (JLM) that will compete with the existing JIF. Although the methodologies are similar, they differ in some ways [11], [25]. CiteScore spread globally, in many different ways, influenced by its own characteristics and the strategic goals of the stakeholders involved.

In the first stage of CiteScore adoption, most publishers initially adopted it to promote their journals, rather than the more traditional JIF from Clarivate [25]. Another advantage of CiteScore over JIF was that it was available in Scopus, which provided broader journal coverage than Web of Science [31], giving publishers more opportunities to use CiteScore, especially for journals outside the Anglo-American core, such as regional or language-specific journals [31]. Integration of CiteScore into institutional and national research evaluation systems has varied greatly around the world. Research into the patterns of adoption of CiteScore in developing countries indicated that the lower cost of access to data compared to Web of Science, as well as the ability of researchers to be able to use CiteScore due to it being accessible via Scopus, made it easier for a wider range of researchers to participate in evaluation frameworks based on metrics [11], [25]. These results highlight broader debates about whether research assessment policies provide equitable opportunities for all researchers, and whether they allow for diversity of scholarly traditions [31]. Adoption of CiteScore has also been shaped by institutional relations between university departments and database providers, as well as by policy decisions made at the national level about what types of metrics should be allowed for evaluating careers and allocating funds [11], [25] For scholars interested in how journal evaluation practices are configured today across different research systems, understanding this process remains essential.

2.2. Comparative reliability: CiteScore versus JIF

In contrast to CiteScore, the academic community has long discussed the reliability of the JIF compared to CiteScore. To date, there is an extensive body of comparative research that examines the technical properties of these metrics and how they imply practical consequences for stakeholders [1], [3], [13] – i.e., the window period effects, denominator construction, and methodologies behind the metrics. A particular focus of the discussion of the denominator problem in JIF Calculation has been how the metric uses Citations to Citable Items but includes non-citable Content in the numerator, creating systematic biases that vary by disciplinary context [18], [20]. Because CiteScore employs a unified definition across all document types when it comes to constructing denominators, CiteScore's approach has been viewed as a methodological refinement that enhances comparability between journals [13]; however, scholars have noted that this unification introduces its own complexities, especially concerning the classification of Editorials, Letters, etc., that may serve different functions within scholarly communication [1], [18]. Comparative research on window-period effects has shown that citation dynamics differ substantially across fields; for example, some fields exhibit rapid citation accumulation, while others show more extended patterns of Influence [3], [13]. These differences in citation dynamics have prompted calls for greater attention to disciplinary specificity in research evaluation rather than relying on standardized metrics applied uniformly across knowledge domains [1], [20]. Finally, differences in transparency between the two metrics have also attracted scholarly scrutiny, with CiteScore generally offering more accessible underlying data through the Scopus platform [13]. Ultimately, consensus has emerged that

context-dependent evaluation frameworks can better serve stakeholders than applying a universal metric [3], [18].

2.3. Open access journals and CiteScore performance

The connections among open access publishing models and CiteScore performance are being developed into an increasingly important area of study in the general body of literature that investigates OA citation advantages and journal assessments [5], [12], [22] . In addition to assessing the degree to which OA journals differ in performance across bibliometric indicators, studies examine the role metrics play in assigning position to OA venues in larger scholarly communication systems.

Research that investigates OA citation advantages has reported mixed results. Some research indicates that articles published under a free access model are cited more quickly and by more authors than those published under a toll-access model; however, other studies have identified potential methodological biases that could affect conclusions drawn from the data [7], [14], [24]. Attention is also given to the way that OA journals are treated within CiteScore calculations so that researchers can determine if the methodology used to calculate CiteScore provides an advantage or disadvantage to OA venues compared to traditional subscription-based journals [5], [9]. Diamond OA journals, which do not charge authors or readers, have brought increased focus to the relationships between Diamond OA models and systems based on metrics for evaluating scholarship [4], [30]. Research indicates that Diamond OA journals generally struggle to gain recognition through metric-dependent systems because they often exist in smaller, discipline-specific niches and lack sufficient financial resources to market themselves and support author outreach efforts [35]. Studies that investigate hybrid journal effects explore the impact that publishers' dual business models, which offer subscription-based access combined with optional author-charged OA options, may have on CiteScore calculations, especially with regard to citation patterns and decisions made by authors regarding where to publish their work [12], [22]. Studies exploring these issues have raised questions regarding whether hybrid models inadvertently encourage or distort certain behaviors in relation to CiteScore calculations [14], [24], which reflects more broadly stated concerns regarding the viability of current scholarly communication models and the ways in which metrics influence authors and publishers [4], [30].

2.4. Transparency, methodology, and manipulation resistance

A number of studies examine CiteScore's performance across three primary dimensions- transparency, methodological rigor, and resilience to manipulation - all of which play a significant role in evaluating journal metrics. Additionally, the broader body of work on establishing a normative framework for the responsible use of journal metrics has identified and articulated evaluative standards for assessing metrics through the Leiden Manifesto and DORA (San Francisco Declaration on Research Assessment) principles. These frameworks articulate standards against which specific metrics may be evaluated based on their adherence to certain principles. For example, the Leiden Manifesto articulates several key principles for using quantitative evaluations appropriately in academic research. These include that quantitative evaluation methods should be used as complementary assessments to expert evaluation; that data collection and analysis processes related to those quantitative evaluations should be performed in a manner that is transparent and open; and that systems developed to facilitate the use of quantitative evaluations should include mechanisms that prevent "gaming" by authors and other stakeholders.

CiteScore's methodology has been studied in relation to how its application of the Leiden Manifesto's principles aligns with its choice to use a single denominator for measuring citation frequency. This includes the impact this decision will have on comparative analyses between publications, as well as its potential to prevent strategic actions by publishers [6].

In addition to studying the methodologies Scopus uses to collect content, abstract, and bibliographic data from each reviewed publication, researchers have also examined how quality-assurance mechanisms affect the accuracy and reliability of the underlying data used to calculate CiteScore values [16]. The CSAB (Content Selection & Advisory Board), which reviews each publication based on established inclusion criteria, serves as a gatekeeper for which publications are included in Scopus and how those included are categorized within the database [15]. Researchers have noted that CSAB's review process can introduce human judgment in addition to algorithmically calculated metrics [16].

Additionally, researchers have also studied Scopus's ability to reevaluate journal categorizations and/or CiteScore values due to concerns over inaccuracies or misrepresentations. The availability and effectiveness/accessibility of these mechanisms directly relate to the accountability of metric systems and the ability of individual journals to correct errors or misrepresentations [15], [16]. Taken collectively, this literature emphasizes the importance of designing institutions in ways that use metrics to inform decisions about publications rather than replace them. The use of CiteScore in LMICs is an emerging subject of study and concern because it represents a different domain of scholarship on applying bibliometrics in the context of global research governance. The study identified both positive and negative trends related to the uptake and use of CiteScore in two major regions: Sub-Saharan Africa and Southeast Asia. In addition, CiteScore's inclusion of titles from LMIC universities and national scholarly society journals has provided increased visibility to research produced in these countries, often left out of databases focused on the publication output of high-income countries [2]. Scopus's language coverage includes journals indexed in more than fifty non-English languages, while the JIF database primarily captures English-language publications. As such, this difference creates differing incentive structures for researchers working within multilingual research systems. Additionally, this ability to include journals from multiple languages has been especially important for journals publishing in Spanish, Portuguese, Arabic, and other regional languages. For many regional journals, citations generated from scholarly networks in their respective native languages offer the best opportunity to gain metric

recognition [29]. An example of how metric mandates can create a "virtuous cycle" in terms of changes in evaluation practices and citation behavior was demonstrated through India's implementation of UGC- Consortium for Academic Research and Ethics (UGC- CARE) as a quality control mechanism for journal lists used in academic promotions. Authors began to strategically submit papers based on whether they would meet the specified CiteScore threshold. Despite the widespread adoption of CiteScore across LMIC research systems, some scholars have raised concerns about "metric imperialism." Metric imperialism refers to applying evaluation frameworks developed in high-income countries to research systems in LMICs without sufficient consideration of differences in local publication norms, research priorities, and institutional capacity. The potential that CiteScore-based evaluations may prioritize international visibility over local relevance has led to calls for developing "differential metrics" that address the structural limitations and developmental goals inherent to research governance in LMICs.

2.5. LMIC Applicability

The relationship between OA publishing modes and CiteScore performance is a growing area of interest among scholars, given the global expansion of OA. Some Diamond OA journals, which do not charge authors directly for accessing their publications and are funded by institutions or consortia, demonstrate different CiteScore trends than those of subscription or hybrid OA journals. Research shows that Diamond OA journals can take some time to develop a consistent CiteScore after being indexed because they may not follow traditional citation patterns associated with older subscription titles with established readerships and citation practices [4], [5]. First-year CiteScores for newly indexed open access titles often show a higher score relative to previously published titles as the result of the fast rate of citations experienced by the newer cohort of OA publications; however, this trend tends to reverse itself as journals grow and cite per paper stabilize [9], [12]. Hybrid journals have further complicated CiteScore calculations by including both subscription-only content and open access articles licensed under open access terms. Researchers have reported significant differences in citation counts of articles published in hybrid OA and subscription formats in the same journal, which could cause CiteScore scores to be biased upwards for journals with high levels of hybrid OA article production [7], [14], [22]. Plan S mandates requiring funder participation in ensuring that all research produced through these funds is available immediately upon publication in open access form have also created additional intersections between OA policy requirements and CiteScore-based evaluation structures. Institutions implementing Plan S have found it challenging to reconcile mandates for immediate OA availability with evaluation structures that favor well-established journal titles, many of which lacked robust OA pathways when these mandates were developed [24], [30], [35].

2.6. OA Journals and CiteScore performance

Regional adoption of CiteScore has occurred at varying rates across global research systems; asymmetries are also evident by geographic context. Studies examining adoption rates in Latin America/South Asia indicate that these regions adopted CiteScore more quickly as a bibliometric standard than East Asian research communities with well-developed JIF metric infrastructures. These East Asian research communities were also committed to existing Western-based evaluation frameworks. The Scopus Content Selection Advisory Board has contributed to the geographically diffused nature of CiteScore by including increasing amounts of regional expertise from previously under-represented research systems in its membership and consultation process. The inclusion of regional expertise is seen as a positive step toward building trust with regional stakeholders and creating more culturally sensitive criteria for journals published outside traditional Anglo-American publishing norms [11]. Adoption patterns within institutions have also shown a typical tension between faculty skepticism about new metrics and administrators' enthusiasm. Administrators have found CiteScore useful because of its computational efficiency and appearance of objectivity. However, faculty in many disciplines have traditionally relied on expert-based evaluation methods and have therefore expressed concerns about substituting algorithms for peer review. Consequently, the differing levels of institutional resistance (faculty vs. administrators) have led to significant variations in the rate of CiteScore adoption within national research systems.

3. Materials and methods

A documentary secondary data analysis approach: an examination of journal metrics evolution and comparative validity within the Scopus ecosystem using a quantitative-qualitative mixed-methods approach. The study used an objective documentary secondary data analysis (SSDA) approach using a mixed-methods, correlational, descriptive, and exploratory research design to evaluate the evolution and comparative validity of journal metrics within the Scopus ecosystem. The quantitative component used a longitudinal correlational analysis of CiteScore data over time, while the qualitative component used a comparative synthesis of the four evaluative dimensions of journal metrics.

3.1. Data sources

Official Elsevier/Scopus CiteScore publications for 2016 and 2023-2024 provided primary data for this study. Official metric releases represented the first comprehensive CiteScore publication and provided the most recent available datasets for calculating journal count trends over the study period. A secondary data synthesis report prepared within the research documentation supplemented the primary source by providing additional bibliometric indicators and trend analyses [3]. We also analyzed correlation coefficients and statistics from the 35 scholarly papers reviewed (empirical studies on journal metrics, ranking methods, and citation dynamics [4], [8]. Documentation for the framework for the UGC-CARE journal validation system and methodology specifications for the Times Higher Education Rankings 2026 were consulted to provide a comparative evaluative context for alternative journal quality indicators [1], [2].

3.2. Analytical framework

To test the first hypothesis concerning the growth in the number of journals covered by CiteScore, Pearson's correlation analysis was conducted to examine the linear relationship between year (2016–2024) and the total number of journals receiving CiteScore metrics. The results revealed a statistically significant positive correlation ($n = 9$, $r = 0.9901$, $R^2 = 0.9804$, $t(7) = 18.691$, $p < 0.001$).

To evaluate the second hypothesis concerning the comparative validity of CiteScore relative to two other evaluation systems (UGC-CARE and THE Rankings), a structured evidence synthesis was conducted. The analysis compared the methodologies of the three systems across four evaluative dimensions: coverage breadth, methodological transparency, resistance to manipulation, and applicability in low- and LMICs [1], [2].

3.3. Limitations

Several methodological limitations warrant acknowledgment. First, as noted above, the journal counts for 2017-2022 are illustrative projections based on identified trend lines because CiteScore data for these intervening years are not released annually. Second, because discipline-specific Social Sciences journal trajectory data were not available in publicly accessible sources, estimates were based on correlation patterns in similar disciplines. Third, this analysis is solely based upon one bibliometric platform (the Scopus/CiteScore), and therefore may have some generalizability issues related to other bibliometric platforms or journal ranking systems that operate outside of this particular framework.

4. Data analysis

4.1. CiteScore coverage growth and temporal trends

The total number of journals included within the CiteScore Index increased dramatically between 2016 and 2024. During that time, the total number of journals covered by CiteScore rose from 22,615 to 31,138, an increase of 37.7% over the eight years. The rate of increase was also consistent each year; the Pearson correlation coefficient between the number of journals added per year and the total number of journals found at the end of each year was very high ($r = 0.9901$). In fact, according to the coefficient of determination ($R^2 = 0.9804$), approximately 98.0% of all variance associated with increases in the number of journals can be attributed solely to differences in time, indicating that the expansion of CiteScore has been due to systematic and intentional institutional investments into the development of bibliometric tools rather than simply being due to chance or happenstance. The statistical significance of this trend is further supported by t-tests ($t[8] = 18.691$, $p < 0.001$), which show that the growth patterns identified in this study would be extremely unlikely to have occurred by chance. CiteScore changed in 2020, when Elsevier began using a four-year citation window instead of the previous two-year window. This change greatly reduced year-to-year variation and improved the reliability of comparisons of long-term score changes. Although both the number of articles published and cited increased substantially in 2024 compared to other years, the average score for the top 1000 journals also slightly decreased between 2023 and 2024. Although published articles increased by a slightly larger percentage than cited articles, some evidence suggests that certain portions of high-impact publications are approaching saturation. Overall, the results support Hypothesis 1, showing a systematic and statistically significant global expansion of CiteScore.

4.2. Technical methodology and indicator construction

The major difference from the earlier work is the use of a four-year citation period as opposed to the two-year period used by the JIF. This has resulted in an approximate 50% reduction in one-year citation variability when comparing the two metrics. Since CiteScore uses the total number of citable items during the four years under consideration (the denominator), it has eliminated the incentive to "front-load" articles to increase citation counts using JIF methodology. Articles are often selectively placed at the beginning of issues to take advantage of this practice. While both CiteScore and JIF provide journal-level information, they differ significantly in access to raw data. Raw CiteScore data is provided at no cost to users by Elsevier, allowing for third-party audits and independent validation of journal rank. Journal Citation Reports, however, is available only through a paid subscription, limiting opportunities for transparent, independent scrutiny of methods. Finally, the larger database size of CiteScore, which includes over 31,000 index entries as compared to less than 22,000 journals included in JIFs, represents a broader disciplinary base and likely offers reduced opportunity for publication-related biases.

4.3. Policy recognition and institutional integration

The use of CiteScore in national and international research policies shows it is an increasingly recognized tool among scholars worldwide [8], [10], [17], [19]. UGC-CARE, the UGC-CARE initiative in India, requires all journals in Group-II of the approved journal list to be listed in Scopus; therefore, CiteScore becomes a necessary metric for PhD thesis approval and the Academic Performance Index (API) used to assess faculty promotion [21], [23], [26]. The same principle applies to Times Higher Education (THE), which uses Scopus as its main database to evaluate research quality, including CiteScore metrics when calculating world university rankings [7], [28]. Institutionalizing policy through this type of framework enables measurable behavior changes: researchers submit their work to Scopus-indexed journals to meet national and/or institutional reporting requirements, thereby increasing submissions to indexed journals [17], [19], [32], [33]. As a result of this virtuous cycle, CiteScore performance of regionally based journals will increase as compliant researchers produce more research that results in more citations for those journals [10], [23], [24]. Furthermore, these administrative frameworks show how research evaluation can accelerate CiteScore adoption regardless of natural scholarly interest in the tool, especially when the evaluation process is tied to researcher career advancement or institutional funding.

4.4. Discipline-specific correlation and reliability patterns

The results vary significantly across disciplines. Therefore, the authors use correlation coefficients to examine the relationship between these two indicators. This shows how well aligned they are for each examined discipline. In anatomy and medicine, the correlation coefficient between CiteScore and JIF was calculated using Spearman's rho and equals 0.91 (Pearson r could be used as an alternative). With a total number of 14 journals that were analyzed, it can be concluded that there is almost perfect alignment between the two measures [13], [18], [20]. Library and information science is another example where the correlation coefficient between CiteScore and JIF is relatively high. Specifically, Pearson r = 0.787 and Spearman rho = 0.828 (n = 43) indicate that the two measures capture the same aspects of citation behavior, but CiteScore provides a broader view of interdisciplinary citation networks compared to JIF, which only considers citations during a limited time period of two years [1]- [3].

Geology is yet another discipline that exhibits strong correlation values, specifically r = 0.804 and rho = 0.71 (n = 25). Even at such high correlation levels, however, ranking positions still change from one indicator to the next. This indicates that, methodologically, the choice of indicator has practical implications [13], [18], [28]. Computer science also has the largest sample size in the study (n = 10869), with strong Pearson (r = 0.80) and Spearman (rho = 0.94) correlations. Thus, computer science shows substantial overlap in citation behavior across disciplines [1], [13], [20]. Therefore, overall evidence supports hypothesis H2. This means that CiteScore reliably produces consistent results across all of the various disciplines while providing particular benefits in those disciplines characterized by long-term citation cycles (e.g., library and information science), interdisciplinary networks (e.g., library and information science), or Open Access publishing models prevalent in LMICs [2], [3], [18].

4.5. OA Publishing performance in engineering

Research on open-access and subscription journal performance in engineering for 2023 highlights key similarities and considerable disparities in prestige concentration [4], [5], [7],[9], [12] between these two journal types. Within the Scopus Engineering category, there are currently 770 open-access journals and 2,243 subscription-based journals, indicating large-scale hybridization across many engineering disciplines [14], [22], [24]. Notably, median CiteScore values for each publication model show nearly identical performance between open-access and subscription journals, with open-access journals averaging about 3.1 and subscription journals averaging 3.2; this suggests real impact parity rather than metric manipulation [5], [9], [12]. Top-10% concentration analysis, however, has shown that while 125 of the best-performing open-access journals achieved premium CiteScore positioning, 359 of the best-performing subscription journals achieved similar positions; clearly, even though there may be an increasing number of engineers able to publish their work in terms of equal impact through open-access journals, there continues to be substantial concentration of prestige among established subscription publishers [4], [7], [30], [35]. Importantly, one of the major advantages open-access journals enjoy over subscription journals is that they can be assigned a CiteScore immediately upon being indexed by Scopus; this represents a significant advantage for new journals seeking to establish credibility and attract high-quality submissions [5], [14], [22]. This pattern is especially relevant to diamond open-access journals operating in LMICs, where article processing charge (APC) barriers prevent researchers from accessing legitimate publishing venues [24], [30], [35]. Overall, the data support the conclusion that CiteScore provides a fair way to evaluate the quality of open-access journals without creating economic barriers that could adversely affect researchers working in resource-constrained environments [4], [7], [9], [35].

4.6. Hypothesis testing

The empirical findings provide support for both research hypotheses developed in this study [1], [3], [13], [18], [20]. Hypothesis H1 was supported by the documented 37.7% increase in the number of journals covered by CiteScore during 2016–2024. This finding was further supported by statistical analysis, which revealed a strong and statistically significant positive correlation ($r = 0.9901$, $R^2 = 0.9804$, $t(7) = 18.691$, $p < 0.001$), indicating a consistent expansion in CiteScore coverage across the global scholarly publishing landscape.

Hypothesis H2 received support from a structured comparative assessment involving multiple evaluative dimensions. The findings highlighted CiteScore's broader journal coverage (31,138 versus 21,000 journals), greater methodological transparency through publicly accessible metric information, and reduced potential for manipulation through a consistent denominator methodology. The assessment also considered its applicability in LMICs, particularly in relation to academic evaluation policies in India [28] and institutional evaluation frameworks associated with THE Rankings [32]- [34]. Furthermore, discipline-specific correlation analyses provided additional evidence of CiteScore's relevance across different research environments. These findings suggest that CiteScore may be particularly useful for interdisciplinary research and fields characterized by extended citation cycles, where conventional JIF methodologies may not adequately reflect the contributions of emerging scholars and developing academic systems.

5. Results and analysis

5.1. Finding 1: A rise in citation score use & evolving methodology (H1)

Empirical analysis reveals a rise in the number of journals using the citation score metric. From 22,615 journals in 2016 that reported citation scores to 31,138 in 2024; the total is up 37.7% over the nine years observed. Overall, we see nearly monotonic increases in citation score use with a Pearson Correlation Coefficient of r = 0.9901, and an R-squared of 0.9804; both are significantly different from zero at p< 0.001. This indicates there is a very strong positive linear relationship between time and citation score usage. There have been two methodological changes relevant to this study: the 2020 changes to how citation scores were calculated based on citation windows, and the 2024 drop of citation scores in the top 1000 due to denominator effects after several new journal categories were added.

Table 2: Year-wise citescore coverage growth and regional milestones (2016–2024)

Year	Total active titles	Growth (%)	Primary regional driver	Key milestone
2016	22,615	—	Western Europe/North America	Official CiteScore launch
2017	23,400 (est.)	3.47	East Asia (China growth)	Regional language title expansion
2018	24,100 (est.)	2.99	BRICS Nations	Conference proceedings inclusion
2019	24,900 (est.)	3.32	Global South	CiteScore tracker monthly updates
2020	25,900 (est.)	4.02	Multidisciplinary	Window revised to 4 years
2021	27,000 (est.)	4.25	Emerging economies	COVID-19 public health surge
2022	28,100 (est.)	4.07	South Asia (India)	Integration with UGC-CARE policy
2023	29,777	5.97	Global (Diversified)	11,144+ titles without JIF included
2024	31,138	4.57	Multilingual/Regional	History becomes largest subject area

5.2. Finding 2: Policy institutionalization

Policymakers now include citation score in formalized research policies, indicating that citation score has become institutionalized into formal governance systems. For example, the UGC CARE Group-II list includes citation score as one of the indicators used to determine whether a journal can be included in a list of approved PhD programs. Additionally, when creating the World University Rankings, Times Higher Education selected Scopus as the main source of bibliometrics for calculating rankings; therefore, citation score takes precedence over other measures of journal impact. These examples suggest a virtuous adoption cycle in which emerging research economies (notably in South and Southeast Asia) rapidly adopt metric-governance strategies.

5.3. Finding 3: Metric validity (H2)

Findings from the convergent validity analysis provide strong evidence for citation score reliability across various subject areas. Cross-metric analyses showed high agreement among metrics. Specifically, Spearman rho was 0.91 for anatomy and medicine, Pearson r was 0.787 for library and information science, Pearson r was 0.804 for geology, and similar estimates of r=0.80 and rho=0.94 were obtained for computer science [3]. These results support that citation score serves as a reliable proxy for evaluating journal quality across the subject areas examined. Findings from the temporal stability analyses suggest that adopting a four-year citation window reduced metric variability by about half relative to the JIF, and eliminated potential for strategic citation manipulation via unified denominator construction (i.e., total citations / total citable items). The CSAB's systematic review protocols led to the review of over 1000 journal titles between 2016–2023, which ultimately resulted in the removal of more than 500 titles from the database. The primary criteria used to remove titles included allegations of publication integrity breaches such as possible data falsification or alteration; lack of achievement of minimum performance metrics, specifically CiteScore metrics less than discipline-specific thresholds; and deficiencies in peer-review processes, which ranged from lack of sufficient reviewers to lack of effective editorial oversight mechanisms [15]. As part of this new model of proactively maintaining and curating the CiteScore Index, it performs two major roles. To maintain the validity of CiteScore as a quality indicator, the continuous removal of low-quality journals ensures that the pool of articles being evaluated does not continually deteriorate. Additionally, creating an open record of title discontinuance provides a publicly available resource that can serve as an ex ante deterrent to predatory publishing behavior. Authors and institutions can check a journal's current status before submitting manuscripts by verifying whether a specific journal has been removed from the database [16].

6. Discussion

The evidence supporting H1 shows an extraordinarily uniform pattern of CiteScore adoption. In other words, this pattern of growth cannot solely be attributed to "organic" scholarly preference for CiteScore. Rather, it reflects intentional policy actions that have consistently encouraged CiteScore use among specific segments of institutions. As such, the India UGC-CARE listing requirements emerge as particularly salient here; these regulatory mechanisms represent an important source of compliance-based incentives for thousands of journals seeking official recognition in the Indian higher education system [8], [10], [11]. Moreover, inclusion of CiteScore in Times Higher Education (THE) rankings provided additional reputational capital to those universities desiring global visibility, and thus represented another form of indirect yet considerable pressure on institutions to adopt CiteScore [17], [19], [21]. In general terms, the process underlying this adoption pattern appears analogous to a self-feeding or virtuous cycle. Initially, policy directives drive uptake. Subsequently, greater utilization leads to greater citation accumulation, and improved citation metrics make journals more attractive. Although similar cycles may exist elsewhere, this self-sustaining phenomenon appears particularly evident in developing economies, where institutional assessments have considerable implications for both career mobility and funding allocations [23]- [28]. Furthermore, for journal publishers operating within these environments, the existence of CiteScore provides new opportunities to measure their research output relative to others. Journal publishers that were able to effectively position themselves utilizing CiteScore within various assessment regime policies acquired competitive advantages they otherwise would not

have possessed had they relied upon JIF-dominated assessment frameworks [31]- [34].

6.1. Reliability & the end of JIF monopoly

As discussed above (H2), the data confirm that CiteScore reliability is highly context-dependent and performs considerably better than JIF in areas that most closely align with four-year citation windows [1]- [3]; i.e., disciplines in which citation times best approximate knowledge dissemination processes. Such structural advantages appear to derive from inherent field-based differences in citation timing. Specifically, some fields tend to exhibit longer mean intervals between publication and peak citation influence. Additionally, the well-documented denominator issue associated with JIF computations - wherein journal size and article volume create systematic distortion effects - is significantly diminished by CiteScore methodology [6], [13], [15]. Additionally, the high discipline-specific correlation coefficients observed between CiteScore and JIF indicate that these metrics are rapidly becoming functionally equivalent within existing disciplinary structures [16], [18], [20], suggesting that CiteScore does not replace JIF but rather complements the metric ecosystem with its own unique advantages. In those domains in which JIF coverage remains limited or non-existent (open-access journals without subscription revenue streams; regional/linguistic journals from the Global South; humanities journals in which 2-year citation windows are inappropriate; computer science conference proceedings with fundamentally different publication dynamics than traditional journals), CiteScore clearly outperforms JIF [29].

6.2. Open access, equity, and Global South implications

CiteScore's ability to provide an appropriate measure of a journal's impact is particularly relevant when considering the historical inequities of journal prestige based on commercial publishing models [4], [5], [7]. CiteScore can provide legitimacy to impact measures for those journals that are otherwise at risk of being excluded from the assessment frameworks used by JIF-dependent institutions, providing the opportunity for journals using open access models (i.e., "diamond" open access) to receive the same level of recognition for their scholarship as journals published via subscription models. CiteScore's multilingual journal coverage (24%) also differs from JIF's primarily English-language focus. As such, CiteScore offers a clear path forward toward greater inclusivity of regional knowledge producers. For researchers from LMICs, access to CiteScore allows them to use "diamond" open access publication strategies that let them publish without paying the high costs associated with article processing fees (APCs). These strategies will be especially useful in LMICs, where funding for research may restrict or eliminate researchers' ability to pay APFs. While CiteScore offers many advantages, these benefits do not necessarily translate into equal prestige across journals. In other words, just because a large number of journals are now available to be evaluated using a new set of metrics (i.e., CiteScore), it does not mean that existing power structures based on decades, if not centuries, of institutional advantage will be dismantled simply by implementing a new metric [30], [35].

7. Limitations and future research

Several methodological issues warrant acknowledgment. Because this study uses intermediate-year projection data for 2017-2022 to estimate H1 trajectories, precision is limited when estimating the number of citations adopted. This reduced precision will likely decrease confidence in the calculated adoption rates [1], [3]. In addition, the estimated correlations of Social Sciences must be viewed as preliminary until they are verified with complete coverage of all databases [18], [20]. Finally, because we used only one database (i.e., Scopus), although this may have been methodologically consistent, we did not explore additional insights that could be derived from Web of Science comparisons to provide evidence of convergent validity for the observed patterns [29]. Additionally, for H1, readers should not interpret the linear relationship as causation. We propose future research on long-term author behavior to determine whether CiteScore availability truly influences authors' submission decisions or merely reflects authors' pre-existing preferences. Further, we suggest investigating citation impact among LMIC researchers rather than using general journal-level metrics; this approach would indicate whether introducing CiteScore has positively affected career advancement opportunities for researchers in the Global South [20]. Both proposed avenues of research would significantly enhance our understanding regarding whether increased diversity in metrics leads to meaningful structural changes, or whether it represents merely superficial additions to the existing framework(s) of measurements. Several methodological limitations appropriately constrain confidence in the current results and suggest useful paths for further research. Using projected values for mid-year intervals during the 2017–2022 time frame introduces some error into the H1 trajectory estimates. This error would be greatly reduced by conducting an analysis based on complete actual citation data over the entire time span [1], [3]. Similarly, the correlation coefficient estimates (Social Science) provided above must be interpreted as preliminary and subject to confirmation via a comprehensive database coverage assessment and thus not as empirical proof [18], [20]. While the present study used a single-database analytic approach, consistent with the methodology used in the present study, it excluded analyses of validity convergence that could have been obtained by comparing coverage levels with Web of Science. Such comparative validation efforts would increase the likelihood that observed relationships reflect underlying bibliometric dynamics rather than differences in indexing practices among databases [29]. Future research efforts should focus on longitudinal studies designed to assess how researchers alter their submission behaviors after the availability of CiteScores, i.e., do they select venues differently due to knowledge of CiteScore's existence? Do CiteScores serve only as a measure of existing publication preferences? Additionally, studies examining citation impact at the author level for scholars from LMICs as opposed to aggregate measures of journals would provide evidence to support whether CiteScore has led to changes in researcher career trajectories, grant awards, and/or institution reputation that could warrant greater equity-based claims than those made possible by aggregation at the journal level [20]. These

additional lines of inquiry will contribute significantly to our understanding of whether bibliographic diversity leads to substantive structural shifts in global scholarly communications or constitutes primarily cosmetic additions to available measurement methodologies, without correspondingly changing the nature of research prestige and resource distributions. The Diamond Open Access Pathway afforded to researchers through CiteScore is of significant interest when considering how Global South research environments are affected by Financial Constraints on Article Processing Charges (APCs), which restrict APC-based open-access publishing [22], [24]. Scholars from LMICs may be able to produce their own Research Impact Metrics through non-APC journals. This enables them to demonstrate their visibility in Institutional Assessment Frameworks, free from the economic exclusion experienced through prestige accumulation in subscription-based journals. The continued concentration of Prestige in Subscription-Based Journals requires an Equitable Adjustment to Equity Claims: of the journals in the Top Decile of CiteScorep,Performance, 359 are subscription-based journals compared with 125 Open-Access Publications. Thus, metrics alone do not restructure the hierarchical advantages accrued over years through differential investment and reputation building [30], [35]. The inequality in prestige distribution indicates that while CiteScore provides additional routes for Global South journals to achieve measurable visibility, the most consequential prestige positions remain largely available only to publishers with established subscription revenue streams and historical market positioning. Therefore, CiteScore yields meaningful but limited equity effects: it increases the Number of Journals Achieving Measurable Impact While Leaving the Fundamental Structures of the global knowledge hierarchy virtually unchanged [4], [5], [7]. Data on CiteScore (citation frequency) performance across journal types provide strong evidence of a trend toward greater parity among journal formats, which is especially important for ensuring fairness in scientific communication. In engineering, we find that CiteScores of open access journals are similar to those of journals that charge subscription fees, both average around a score of about 3.1 vs. 3.2, respectively; this is a similarity that was unattainable by virtue of the fact that most previous JIF -based methodologies suffered from "denominator distortion" and "coverage limitation," and therefore, provided systematic disadvantage against all open access journals, placing them at the periphery of their respective discipline's hierarchical structures. Furthermore, because an estimated 24-percent of CiteScore-registered titles publish articles in fifty or more different languages, our results show that there are actual opportunities for diversity and representation for regional knowledge producers who use multiple languages and were formerly excluded by traditional bibliometrics [9], [12], [14] as well as other forms of dominance. Thus, CiteScore availability does not simply provide metrics; it also represents institutional recognition in evaluation systems that previously acknowledged only JIF-registered journals.

8. Conclusion

This study provides an empirical basis for understanding how CiteScore, as a journal-level metric, has evolved in global scholarly communication. It establishes a longitudinal framework (2016-2024) showing that CiteScore has included 37.7% more journals since 2016 (22,615 to 31,138), supporting its continued, widespread growth as a means of covering different types of scholarship [35]. The first hypothesis has received support. A Pearson correlation test assessed whether the number of journals covered by CiteScore over time is related; it produced $r = 0.9901$, $R^2 = 0.9804$, and $p < 0.001$. As such, we conclude that journal adoptions using CiteScore show significant positive correlations throughout the period examined. The second hypothesis is well supported by four structural advantages that distinguish CiteScore from other journal metrics. The four-year citation window provides enough time for citation development while still allowing the metric to respond to changing journal activity levels. Using a single base unit allows a consistent methodology across disciplines. Finally, the free and public nature of the data removes access barriers to the calculation process and enables third parties to independently verify each calculation. Additionally, CiteScore covers many open-access and LMICs journals, providing an additional layer of equity in the metric's design. Reliability of CiteScore across disciplines is supported by moderate-to-high correlation coefficients: 0.91 (Spearman's rho) in medicine, 0.787 (Pearson r) in library and information sciences, and 0.80 (Pearson r) in geology [35]. These results indicate that CiteScore successfully identifies relevant performance measures across diverse academic environments. Additionally, some evidence suggests open-access parity between open-access journals (median score of 3.1) and subscription-based journals (median score of 3.2) in certain engineering disciplines. However, as noted above, we do not believe CiteScore consistently disadvantages one publishing model over another. Finally, institutions have legitimized CiteScore by incorporating it into the curatorial processes associated with UGC-CARE lists in India, and by including it in the Times Higher Education Rankings, thereby demonstrating that CiteScore has become established for assessing quality in higher education. The decrease in average scores among the top-1000 journals in 2024 compared to prior years may indicate a "denominator" effect due to increased publication rates globally, but it clearly shows that CiteScore continues to adjust to changes in publication practices rather than suffering from inflationary pressures. Collectively, our findings show that CiteScore has raised expectations for journal-level metrics by integrating comprehensiveness, methodological transparency, and equitable treatment of various publishing models and national systems. Collectively, CiteScore's statistical validity, structural advantages, and institutionalization suggest it represents a revolutionary force for evaluating quality in scholarly communications. To continue evolving responsibly in developing quality metrics for journals, future generations of researchers and evaluators must remain committed to transparency, equity, and methodological rigor in their evaluation efforts to advance the interests of the global research community.

Declarations and ethical statements

Conflict of interest: The authors declare that there is no conflict of interest.

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Artificial Intelligence usage statement: During the preparation of this work, the authors used ChatGPT to assist with grammatical corrections. After using this tool, the authors reviewed and edited the content as needed and take full responsibility for the content of the published article.

Ethical consideration: All data utilized in this study came from publicly available documents and/or materials (official metric releases, published scholarly articles, publicly accessible institutional framework documentation). This documentary SSDA approach used no proprietary or restricted data, and it involved no human subjects.

Availability of data and materials: The paper uses secondary data and the same has been produced by way of tables in the paper.

CRediT authorship contribution statement

Samaya Pillai: Conceptualization, Methodology & Writing – original draft. **Srinivasa Rao Kasisomayajula**: Conceptualization, Methodology & Validation.

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