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Research Article

Rethinking Journal Selection: An Author-Centric, Multi-Index Framework for Context-Sensitive Evaluation

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ABSTRACT

Journal selection requires authors to balance scholarly quality, accessibility constraints, disciplinary fit, and global visibility considerations. Conventional journal evaluation systems rely heavily on prestige-based indicators, often overlooking the diverse decision contexts faced by authors at different career stages and institutional environments. Our study introduces the Author-Centric Journal Selection Index (AJSI), a multidimensional framework designed to generate journal recommendations tailored to distinct author profiles rather than a single universal ranking. Using open bibliometric data covering 63,016 journals, our framework integrates four indices; accessibility, quality, scope and relevance; and operationalizes five representative author profiles: Early-Career, Prestige-Seeking, Global Visibility-Oriented, Balanced Strategic and Global South. Each profile reflects a different publication decision logic and emphasizes feasibility, recognition, international reach or resource constraints. Results show that journal suitability varies systematically across author profiles. Early-Career and Global South authors prioritize accessibility and legitimacy, leading to different journal choices compared with prestige-oriented authors, who concentrate on established high-impact outlets. Profiles focusing on feasibility and access also show greater exposure to structural risks while relevance-oriented profiles maintain more stable journal selections across disciplines. Despite these differences, overall journal tiers remain consistent which suggests that profile-specific prioritization reshapes journal recommendations without destabilizing the broader evaluation structure. These findings demonstrate that journal selection is fundamentally context-dependent and shaped by author circumstances. The AJSI framework provides a transparent and adaptable decision-support mechanism that complements traditional bibliometric indicators and supports more equitable and context-sensitive publishing decisions by explicitly incorporating author priorities into the evaluation process.

Keywords: Author-Centric Journal Selection, Bibliometrics, Decision-Support Systems, Equity in Scholarly Publishing, Global South, Open Access.

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INTRODUCTION

Authors must select journals carefully. This choice shapes the visibility of their work, eventual citation accumulation, career trajectories and how institutions assess performance (Hicks *et al.*, 2015; Naik *et al.*, 2023). In practice, many authors resort to shortcuts, most notably prestige hierarchies derived from citation volumes and ranked lists, even though these proxies overlook the varied practical constraints and field-embedded priorities that guide decision-making (Moore *et al.*, 2017; Bornmann and Haunschild, 2018).

Prevailing evaluation tools concentrate on prestige signals such as raw citation tallies and journal impact factors (Garfield, 2006; Gonzalez-Pereira *et al.*, 2010; Bornmann and Marx, 2016). Such indicators offer only partial guidance because they neglect publication paywalls, disciplinary scope boundaries, geographic patterns of readership and day-to-day feasibility considerations (Hicks *et al.*, 2015; Tennant *et al.*, 2019). Empirical comparisons repeatedly demonstrate divergence between what bibliometric scores emphasize and how authors themselves judge journal suitability, especially in interdisciplinary domains.

This mismatch becomes more pronounced for early-career scholars and those based in the Global South. Article processing charges and uneven coverage in major indexes impose asymmetric burdens that steer publishing choices away from prestige-oriented targets (Mbaye *et al.*, 2022; Nabyonga-Orem *et al.*, 2022; UNESCO, 2022). Even authors with ample resources routinely weigh trade-offs among turnaround times, thematic fit, target audience and prestige thresholds which emphasizes that

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journal selection constitutes a multidimensional decision rather than a linear ordering exercise (Rowlands *et al*., 2004; Tenopir *et al*., 2016; Bornmann and Haunschild, 2018).

Many recent studies call for evaluation approaches that move beyond one-size-fits-all rankings toward context-aware procedures. However, existing alternatives often remain conceptual, rely on small samples or omit clear specification of how author priorities enter the model (Seiler and Wohlrabe, 2014).

Recent research shows that AI-based journal recommendation systems can provide useful guidance for manuscript-journal matching, but their effectiveness varies across disciplines and often requires complementary human expertise, particularly for interdisciplinary or complex research contexts (Farber, 2025).

While automated journal finder tools can reduce search effort and improve initial manuscript–journal alignment, final journal selection remains a strategic decision requiring contextual judgment by authors, reinforcing the need for author-centric evaluation frameworks (Vaishnav, 2026).

The present paper addresses these shortcomings through the Author-Centric Journal Selection Index (AJSI). We position AJSI as a decision-support tool that tailors journal suitability to the specific circumstances and objectives of individual authors. The framework assembles four separate indices; accessibility, quality, scope and relevance; and recombines them under flexible weighting regimes that reflect different author profiles. In doing so, AJSI engages with broader debates on reforming research assessment by explicitly recasting journal selection as an author-centered optimization process (Hicks *et al*., 2015; Naik *et al*., 2023; Waltman and Traag, 2020).

LITERATURE REVIEW

Prestige-Dominant Journal Evaluation Systems

Journal evaluation has long relied on citation-based measures, with the Journal Impact Factor serving as the most prominent index through its aggregation of citations (Garfield, 2006). Critics have identified statistical flaws in these indicators, including sensitivity to outliers and susceptibility to gaming practices (Seglen, 1997; Bornmann and Marx, 2016). Network-aware composites such as the SCImago Journal Rank attempt to mitigate some weaknesses by drawing on citation linkage patterns; however, they largely preserve the core emphasis on prestige hierarchies (Gonzalez-Pereira *et al*., 2010; Waltman and Traag, 2020).

A persistent problem lies in the extension of journal-level aggregates to assess individual articles or researchers, a practice that incentivizes publication in high-visibility journals (Naik *et al*., 2023). The Leiden Manifesto and related policy statements explicitly warn against over-reliance on isolated metrics, urging evaluators to incorporate indicators within broader contextual judgments (Hicks *et al*., 2015).

Prestige-oriented systems nonetheless retain strong influence over submission patterns and career decisions, even as their conceptual and ethical limitations accumulate (Bornmann and Haunschild, 2018).

Journal Selection as a Multi-Criteria Decision Problem

An expanding line of inquiry treats journal selection as a balancing act among several partly conflicting considerations. Surveys and interview-based studies consistently identify factors such as thematic alignment, readership profile, manuscript turnaround time, likelihood of acceptance and open-access arrangements as decisive elements in authors' choices (Rowlands *et al*., 2004; Tenopir *et al*., 2016). These patterns challenge the notion that prestige operates as the sole or overriding driver.

Formal Multi-Criteria Decision Analysis (MCDA) approaches have been adapted to capture such trade-offs, particularly in management and information science contexts (Zavadskas *et al*., 2014). Existing MCDA tools tailored to journal selection, however, frequently suffer from narrow disciplinary coverage, small empirical bases or dependence on user-supplied judgments that hinder replication and wider adoption (Donthu *et al*., 2021; Seiler and Wohlrabe, 2023).

Bibliometric scholarship increasingly calls for larger-scale and transparently data-grounded alternatives that more closely mirror observed author behavior (Bornmann and Haunschild, 2018).

Beyond Citations: Accessibility, Scope and Relevance

Open-access models have elevated accessibility concerns within evaluation debates. Evidence links article processing charges, licensing terms, copyright conditions and waiver availability to submission patterns, with pronounced effects among funding-constrained authors (Solomon and Björk, 2012; Mbaye *et al*., 2022; Tennant *et al*., 2019). In contrast, mainstream ranking schemes incorporate accessibility dimensions only marginally, if at all.

Scope considerations likewise shape journal selection decisions. Multidisciplinary journals promise wider exposure but sometimes at the cost of disciplinary signalling or perceived standing.

International authorship networks and readership distributions add further layers to relevance judgments, influencing citation flows and uptake in policy or practice arenas (Wagner *et al*., 2018).

Equity, Global South and Structural Constraints

Structural asymmetries in scholarly publishing have been extensively documented, particularly for researchers in low- and middle-income environments (UNESCO, 2022; Nabyonga-Orem

et al., 2022). Inconsistent or non-transparent waiver mechanisms within Article Processing Charge (APC)-driven open-access models can widen these disparities (Mbaye *et al*., 2022). Early-career authors face additional hurdles, ranging from limited institutional support to increased exposure to exploitative publishing outlets (Cobey *et al*., 2019).

Recent analyses increasingly locate these disparities in the architecture of publishing and research assessment infrastructures rather than in isolated personal circumstances. Accordingly, calls have grown for redesigned evaluation frameworks that explicitly incorporate author-specific limitations instead of presuming equal footing within prestige hierarchies.

Gaps in Existing Journal Evaluation Frameworks

Existing evaluation frameworks retain notable shortcomings even after sustained criticism of citation-centric approaches. Many continue to collapse diverse indicators into singular and universal orderings, paying limited attention to variations in author circumstances (Bornmann and Haunschild, 2018). Large-scale empirical validation remains sparse and sensitivity analyses under alternative weighting regimes are often absent or superficial (Seiler and Wohlrabe, 2023; Waltman and Traag, 2020). Consequently, the robustness and practical relevance of such rankings across diverse author priorities remain open questions.

The documented expansion of publishing activity, encompassing work in roughly 60 languages from more than 130 countries, further highlights the mismatch between dominant evaluation tools and the realities of global scholarly output (Khanna *et al*., 2022). This distribution highlights the need for frameworks capable of accommodating global diversity and multiplicity.

Recent research shows that AI-based journal recommendation systems can provide useful guidance for manuscript–journal matching, but their effectiveness varies across disciplines and often requires complementary human expertise, particularly for interdisciplinary or complex research contexts (Farber, 2025). These limitations highlight the growing need for author-centric journal evaluation frameworks.

Positioning of the Present Study

We introduce the Author-Centric Journal Selection Index (AJSI) as a distinct decision-support construct. Unlike conventional ranking exercises centered on prestige, AJSI assembles four standalone indices; accessibility, quality, scope and relevance; and recombines them under parameterizations corresponding to different author profiles. AJSI framework engages directly with ongoing debates on publishing equity and the responsible application of bibliometric evidence by framing journal selection as an optimization process oriented toward individual priorities (Hicks *et al*., 2015; Naik *et al*., 2023; Waltman and Traag, 2020).

METHODOLOGY

Research Design and Objective

We adopted a large-scale, author-centric bibliometric design to construct the Author-Centric Journal Selection Index (AJSI) in this study. It serves as a decision-support framework for authors aiming to select journals based on their unique constraints and priorities. Unlike existing journal evaluation systems which typically prioritize institutional prestige and citation dominance etc. (Vuong *et al*., 2022). the AJSI framework integrates four analytically distinct indices designed to model different author decision logics, including accessibility, scholarly impact, geographic reach and scope.

Core Indices

- **Accessibility Index (AI)** – measures economic and structural access for authors.
- **Quality Index (QI)** – measures scholarly stature based on citations, prestige and indexing.
- **Scope Index (SI)** – captures a journal's disciplinary breadth and operational capacity.
- **Relevance Index (RI)** – gauges global connectedness and international collaboration.

These indices are computed using open and reproducible data sources which ensures transparency, scalability and reliability.

The AJSI is designed to aid authors by providing an optimized journal ranking tailored to their specific needs rather than forcing all journals into a single prestige hierarchy.

Data Sources and Coverage

The data sources used for this study, mentioned below are open-access and ensures reproducibility and comprehensiveness. We aggregated following data sources.

Source Primary	Use
OpenAlex	Citation counts, authorship geography, institutional collaborations, publication volumes, OA inference
DOAJ	Open Access model (OA), APC data, waiver policies
SCImago (SJR)	Prestige metrics, self-citation rates, subject categories
Crossref (via OpenAlex)	DOI continuity, indexing presence
Indexed Databases	Scopus, WoS, DOAJ, Google Scholar, WorldCat, ABDC
Predatory Lists	Beall's List, KScien (used exclusively for penalties)

Master Dataset

The final dataset comprises 63,016 journals mapped by OpenAlex ID and harmonized ISSNs which ensured comprehensive journal identification.

- OpenAlex as spine.
- DOAJ as OA/APC authority.
- SCImago as prestige/self-citation authority.

Normalization Strategy

All indices in the AJSI framework are percentile-normalized which accounts for strength against skewness, structural zeros and outliers. This ensures that authors can make decisions based on relative journal rankings rather than absolute values. The percentile normalization formula is:

$$N_x = \min\left(1, \frac{X_i}{X_{95}}\right)$$

where:

$X_{95}$is the 95th percentile of the relevant data after excluding structural zeros and extreme outliers.

In cases where the 95th percentile equals zero, the normalized score is set to zero to avoid undefined scaling.

Missing Data Handling

Missing values are automatically handled via weight redistribution to ensure that journals are not penalized for partial data availability.

Indices Formulation

Accessibility Index (AI)

Conceptual Rationale

The Accessibility Index (AI) measures the author-facing access to journals and focuses on both economic and structural accessibility. This is critical for early-career researchers and Global South authors.

Constituents

We used OA, APC and WAIVER since the data is open source extracted from OpenAlex and DOAJ (both are community driven, authentic and publicly available). Accessibility Index components and their description with weights are mentioned in above Table 1.

For journals with unknown APC information, we assigned no score (Table 2) rather than a minimum penalty because APC data are often incompletely or inconsistently reported across publishers and currencies. Penalizing such cases would risk introducing systematic bias against journals with otherwise transparent access and quality signals. Minimum scores were applied to other unavailable attributes to conservatively reflect uncertainty in those dimensions.

Formula for AI Calculation

$$AI=(0.50\times N\_OA)+(0.30\times N\_APC)+(0.20\times N\_WAIVER)$$

We prioritized Article Processing Charge (APC) data from DOAJ as the primary source. Where APC information was unavailable in DOAJ, secondary priority was given to APC data reported in OpenAlex. In cases where APC data were not available from either source, journals were provisionally classified as having no APC.

When APC information was missing across both DOAJ and OpenAlex, journals were conservatively classified as "No APC" only if they were explicitly identified as Diamond or subscription-based journals. Otherwise, APC status was treated as missing to avoid introducing systematic misclassification.

Although embargo duration represents an important dimension of publication access, no open and scalable data source currently provides standardized embargo information at the journal level across large multidisciplinary datasets. Therefore, embargo effects were indirectly approximated through Open-Access (OA) type classification. For example, journals listed in DOAJ were assumed to provide immediate access, while journals with delayed or conditional access arrangements were conservatively treated as non-immediate OA.

Future versions of the AJSI framework may incorporate journal-level embargo indicators as standardized and openly available embargo datasets become established.

Within the Accessibility Index, Open-Access status (N_OA) was assigned the highest weight (0.50) because it determines the fundamental feasibility of publication access. A journal that is fully open access removes baseline structural barriers for authors, particularly those with limited institutional resources. Article

Processing Charges (N_APC) were assigned a weight of 0.30 to capture the direct financial burden associated with publication. While cost is important, it becomes relevant only after access conditions are established. Waiver availability (N_WAIVER) was assigned a weight of 0.20 because it functions as a conditional relief mechanism that partially offsets financial barriers but does not independently determine accessibility.

Quality Index (QI)

Conceptual Rationale

The Quality Index (QI) evaluates scholarly impact and combines citation network authority, citation intensity, journal longevity and indexing legitimacy. This index excludes editorial-process noise such as rejection rates or desk rejections.

Constituents

Normalization

- SJR95 = 9^{5th} percentile of SJR (field-agnostic global), N_SJR = 95th percentile of SJRCPWTQ = 95th percentile of SJR (field-a, CPWTQ95 = 95th percentile of CPD (global), N_CPWTQ = 95th percentile of CPD (glN_AGETQ = 95th percentile of CPD (global)ostiCPD5$_i$ = cites_5y$_i$ / works_5y$_i$, CPD95_5y = 95th percentile of CPD5, N_CPD5$_i$ = MIN(1, CPD5$_i$ / CPD95_5y)
- N_SSI$_i$ = 0.6 × N_AGE$_i$ + 0.4 × N_CPD5$_i$

Formula for QI Calculation

$$QI=(0.35\times N\_SJR)+(0.30\times N\_CPWTQ)+(0.20\times N\_SSI)+(0.15\times N\_INDEXED)$$

We introduced Indexing coverage (N_INDEXED) based on the number of major bibliographic databases in which a journal is indexed, including ScienceDirect, JSTOR, SCImago, DOAJ, Scopus, Google Scholar, WorldCat, ABDC, Web of Science and Crossref. Journals indexed in more than five of these databases were classified as having very high coverage and assigned a score of 1.00. Coverage in four to five databases was scored as high (0.75), two to three databases as moderate (0.50) and a single database as low (0.25). Journals not indexed in any of the listed databases received a score of 0.00.

We assigned highest weight (0.35) to the SCImago Journal Rank metric (N_SJR) because it reflects citation network authority and scholarly prestige which remain central signals of journal quality in academic evaluation systems. Citation intensity (N_CPWTQ) was assigned a weight of 0.30 to capture the average citation performance of published work.

Stability (N_SSI), combining journal age and recent citation performance, was assigned a weight of 0.20 to represent long-term reliability and continuity. Indexing coverage (N_INDEXED) was assigned a weight of 0.15 because indexing enhances discoverability and legitimacy but typically follows from established scholarly reputation rather than defining it independently.

Scope Index (SI)

Conceptual Purpose

The Scope Index (SI) reflects a journal's ability to accommodate diverse submissions. This index prioritizes disciplinary breadth, editorial continuity and publication frequency.

Components

OpenAlex and SCImago were used as the primary data sources for calculating the components of the Scope Index, as outlined in Tables 3-5. The variable **N_YSP** was normalized using a logarithmic transformation as mentioned below to prevent disproportionately large advantages for older journals and to ensure a more balanced representation of editorial continuity across journals of different ages.

$$N\_YSP = MIN(1, LOG10(journal\_age) / LOG10(50))$$

Formula for SI Calculation

$$SI=0.40\ N\_CAT+0.30\ N\_YSP+0.30\ N\_FP$$

For calculating the Scope Index, we assigned highest weight (0.40) to subject breadth (N_CAT) because disciplinary coverage directly determines the range of submissions a journal can accommodate. Sustained publication years (N_YSP) has a weight of 0.30 to represent editorial continuity and operational stability over time. Publication frequency (N_FP) was also assigned a weight of 0.30 because it reflects processing capacity and the likelihood of

Table 1: Accessibility Index Constituents, their inclusion logic, normalization rule, sources used and their weightages in AI.

Component	Code	Purpose	Normalization Rule	Weight
Open Access Model	N_OA	Indicates the type of Open Access model	Categorical scoring	0.50
APC Level	N_APC	Measures the financial burden (APC levels)	Percentile scaling	0.30
Waiver Policy	N_WAIVER	Availability of waiver for Authors	Binary scoring (1 = Waiver, 0 = No)	0.20

timely publication which are practical considerations for authors selecting target journals.

Relevance Index (RI)

Conceptual Purpose

The Relevance Index (RI) quantifies global scholarly connectedness by measuring institutional diversity and international collaboration. This index is crucial for understanding how well a journal's reach extends globally.

Components

Here we used openalex and scimago as primary data sources. Table 6 above mentions each component weights and normalization rule.

Table 2: Scoring Scheme for Open Access Model and Article Processing Charges (APC).

Access Dimension	Category	Description	APC Range (USD / EUR / GBP / CHF / AUD / CAD)	Applicable Journal Type	Score
Open Access Model (N_OA)	Diamond OA	Fully open access with no APC	0	Diamond OA	1.00
	Gold OA	Open access with APC	> 0	Gold OA	0.75
	Hybrid	Optional open access within subscription journal	Variable	Hybrid	0.50
	Subscription	Closed access journal	Not applicable	Subscription	0.25
	Unknown	OA status not reported	Not reported	Any	No score
APC Level (N_APC)	No APC	No publication fee charged	0	Diamond OA	1.00
	Low APC	Low publication fee	≤ 500 (including local currency equivalents)	Gold OA	0.75
	Medium APC	Moderate publication fee	501 – 1500	Gold / Hybrid	0.40
	High APC	High publication fee	> 1500	Gold / Hybrid	0.10
	Subscription No APC	Subscription journal without APC	0	Subscription	0.60
	Unknown	APC information not reported	Not reported	Any	No score

Table 3: Quality Index Constituents, their inclusion logic, normalization rule, sources used and their weightages in QI.

Component	Code	Purpose	Normalization Rule	Weight
SJR (Prestige)	N_SJR	Measures citation network authority	SJR95 normalization	0.35
Citation Intensity	N_CPWTQ	Measures total citations relative to works	Percentile scaling	0.30
Stability	N_SSI	Measures journal longevity and sustained performance	Weighted sub-index (N_AGE + N_CPD5)	0.20
Indexing	N_INDEXED	Indicates indexing legitimacy	Binary normalization	0.15
Recency	N_CPD5	Recent citations (5yr) per year measures sustained citations	Percentile scaling	-
Longevity	N_AGE	Measures journal longevity	Log scaling	-

We have used Scimago and OpenAlex as primary data sources used in above Table . Secondary sources like Crossref, Wos, ABDC, scopus etc are used to calculate N_INDEXED.

Table 4: Scope Index Constituents, their inclusion logic, normalization rule, sources used and their weightages in SI.

Component	Code	Purpose	Normalization Rule	Weight
Subject breadth	N_CAT	Multidisciplinary	Percentile scaling	0.40
Sustained publication years	N_YSP	Editorial continuity	Log scaling	0.30
Publication frequency	N_FP	Operational capacity	Frequency bins	0.30

Normalization and Computation of Relevance Index Components

- N_IC =(Number of multi-country papers) / (Total papers sampled).
- GI95 = 95th percentile of unique_author_countries.
- N_GI = 95th percentile of unique_author_countri.
- N_IC = 95th percentile of,
- ID95 = 95th percentile of unique_institutions.
- N_ID = 95th percentile of unique_institutio.
- N_CR = 95th percentile of uniqu.

Formula for RI Calculation

$$RI=0.30\ N\_GI+0.30\ N\_IC+0.25\ N\_ID\ +0.15\ N\_SC$$

N_ID was removed for RI after Spearman Correlation analysis and revised weightage used was

$$RI=0.40\ N\_GI+0.30\ N\_IC\ 0.30\ N\_SC$$

Here, geographic reach (N_GI) was assigned the highest weight (0.40) because international author diversity is the strongest indicator of global visibility and scholarly diffusion. International Collaboration (N_IC) carries a weight of 0.30 to represent cross-border knowledge exchange and network connectivity. Self-Citation orientation (N_SC) has a weight of 0.30 as a moderating factor that reflects outward scholarly engagement and reduces the risk of insular citation behavior.

Speed Index (N_SPEEDSP)

- **Assumption:** Missing values → 0.50 (neutral).
- **Design decision:** SDI is applied only to Early-Career and Global South profiles using an infinitesimal ε (10^{-6}) as a lexicographic tiebreaker and not a score driver.

Submission-to-publication speed acts as a non-structural and profile-conditional refinement. Its components and weights are mentioned in Table 7. Given its limited coverage and temporal volatility, speed information was used only to refine rankings for time-sensitive author profiles specifically early-career and Global

Table 5: Scoring Scheme for Scope Index Components: Subject Category Breadth (N_CAT) and Publication Frequency (N_FP).

Scope Dimension	Category	Number of Categories	Description	Score
Subject Category Breadth (N_CAT)	Multidisciplinary	≥ 5 categories	Covers multiple disciplines and domains	1.00
	Broad	3 – 4 categories	Covers several related disciplines	0.80
	Moderate	2 categories	Limited but not single-discipline	0.60
	Narrow	1 category	Single subject focus	0.50
	Missing / Unclear	Not reported	Category information unavailable	0.40
Publication Frequency (N_FP)	Continuous / Rolling	≥ 200 articles per year	High-volume continuous publishing	1.00
	Monthly / Bi-monthly	100 – 199 articles per year	Regular periodic publishing	0.75
	Quarterly	30 – 99 articles per year	Moderate publication volume	0.50
	Annual / Irregular	1 – 29 articles per year	Low or inconsistent output	0.25
	Unknown	Not reported	Publication frequency unavailable	0.10

Note. Table Subject category breadth (N_CAT) captures disciplinary diversity while publication frequency (N_FP) reflects operational capacity. Both dimensions are treated as independent contributors to the Scope Index and are derived from Scimago and OpenAlex metadata.

Table 6: Relevance Index Constituents, their inclusion logic, normalization rule, sources used and their weightages in RI.

Component	Code	Purpose	Normalization Rule	Weight
Geographic reach	N_GI	Global author-country diversity	Percentile scaling	0.30
International collaboration	N_IC	Cross-border authorship	Percentile scaling	0.30
Institutional diversity	N_ID	Spread of academic institutions	Percentile scaling	0.25
Self-citation rate	N_SC	Outward scholarly orientation	1 - % self-citations	0.15

South researchers when such data were available, with missing values treated as neutral.

Statistical Validation for AJSI and Metrics Components

The following tests were conducted:

- Spearman correlations (non-parametric).
- Standardized Regression Analysis.
- Component – Index Correlations and Intercomponent Correlation (Spearman).
- Rank-based PCA (van der Waerden scores).
- Parallel analysis.
- Robust Top-K simulation (Dirichlet weights).
- Pareto frontier extraction.
- Field × Profile × Tier stratification.

Predatory exposure audits

The stability and validity of component and index-level weight assignments were evaluated through multiple complementary procedures. First, we conducted correlation analysis to calculate the association between each component and its corresponding index. Strong and consistent rank-based relationships confirmed that higher-weighted components meaningfully contributed to index variation. Second, principal component analysis determined the latent structure of the four indices. The resulting two-dimensional configuration supported the grouped weighting logic used in the final aggregation. Third, sensitivity analysis using Dirichlet-distributed weighting scenarios tested ranking robustness under substantial variation in weight configurations. High rank concordance across scenarios indicated that the overall ranking structure was not driven by a single component or arbitrary weight selection. These validation procedures demonstrate that the assigned weights are empirically stable, theoretically grounded and not sensitive to moderate perturbations.

Final AJSI Aggregation

Principal component analysis revealed two dominant latent components explaining the majority of variance in the index structure. The first component clustered the Quality Index (QI) and Relevance Index (RI) which showed a shared latent dimension related to scholarly stature and global connectedness. The second component grouped the Accessibility Index (AI) and Scope Index (SI) which reflects a distinct latent dimension associated with author-facing constraints and publication capacity. Based on this empirical separation, indices were organized into two conceptual blocks rather than treated as independent or equally substitutable dimensions. The Scholarly Stature block (QI, RI) was assigned a total weight of 0.60, with QI = 0.30 and RI = 0.30 as per its dominant variance contribution in the PCA. The Author Constraints block (AI, SI) received a total weight of 0.40, with AI = 0.20 and SI = 0.20, consistent with its secondary but substantively important role. This block-wise weighting ensures that aggregation reflects empirically observed structure while preserving interpretability and stability in final rankings.

The final Author-Centric Journal Selection Index (AJSI) is computed as a weighted sum of the four indices:

$$AJSI = 0.30QI + 0.30RI + 0.20AI + 0.20SI$$

For journals flagged as predatory (from Beall's or KScien), we applied a Penalty Factor (PF):

$$AJSI^{*} = AJSI \times (1 - PF)$$

Predatory Flag was used from Beall's and KScien database to exclude those journals from consideration and revised AJSI* score was assigned to journal as per criteria: Predatory-Yes, PF is 1 and Predator-No, PF is 0.

A binary exclusion was adopted to reflect the non-compensatory nature of predatory status which cannot be offset by performance of other dimensions.

Author Profiles and Suitability Functions

Profile Definitions

Our novel author profiles reflect distinct decision logics and correspond to different optimization priorities across the four indices:

Five author profiles created based on author primary decision problems and core priorities as mentioned in above Table 8.

Author Profiles Tier Decision Rule

Journals were assigned to tier categories based on percentile rank thresholds. Journals in the top 10% (≥ 0.90) were classified as Elite Targets reflecting highly selective outlets with potentially high payoff. Journals ranked between the 75th and 89th percentiles were labelled as Strong Prospects, representing reputable and realistic options for well-prepared submissions. We categorized journals in the 50th to 74th percentile range as Viable Options, indicating solid outlets with reasonable acceptance likelihood. Journals below the 50th percentile were designated as Fallback Options, only suitable under strong constraints or strategic necessity.

Suitability Functions

These profiles are optimized based on different combinations of indices, with weighted emphasis on different components:

Author profile scores were calculated based on formula mentioned above in Table 9 and were converted into Ranks using percentile criteria.

SUMMARY

Our methodology integrates theoretical foundations with data-driven decision-making and ensures reproducibility and author-centric logic. The framework is designed to be flexible and context-sensitive providing authors a clear decision-support tool for journal selection based on their specific goals and constraints.

RESULTS

Descriptive Statistics and Distribution of Core Indices and their constituents

Descriptive Statistics of AJSI

This section summarizes the empirical distributions of the four AJSI indices using descriptive statistics, histograms, and Q–Q plots.

Accessibility Index (AI)

The Accessibility Index shows as mentioned in above Table 10 and Figure 1, a moderate central tendency with clear clustering at discrete score levels. Histogram spikes and stepwise Q–Q deviations confirm strong departures from normality driven by OA and APC thresholds.

Quality Index (QI)

We found that Quality Index is strongly right-skewed with most journals concentrated at low-to-moderate values and a long upper tail. Histogram density and Q-Q plots jointly indicate heavy-tailed behavior and systematic non-normality.

Scope Index (SI)

The Scope Index exhibits a relatively compact and near-symmetric distribution centered around mid-range values. However, Q–Q

Table 7: Scoring Scheme for Submission-to-Publication Speed (N_SPEEDSP).

Submission-to-Publication Duration (Weeks)	Speed Category	Description	Score
1 – 6	Very Fast	Rapid editorial and production turnaround	1.00
7 – 12	Fast	Efficient review and publication process	0.75
13 – 26	Moderate	Standard review and production timeline	0.50
27 – 52	Slow	Extended review or backlog delays	0.25
> 52	Very Slow	Excessive publication delay	0.00

Table 8: Author profiles based on primary decision problem and core priorities.

Profile	Representative Authors	Primary Decision Problem	Core Priorities	What Matters	What Does Not Matter
Early-Career	PhD scholars, post-docs, early-career faculty	Where can I realistically publish without financial or institutional exclusion?	Feasibility and affordability with baseline legitimacy	Accessibility; Acceptance feasibility	Elite prestige signalling; Historical legacy
Prestige-Seeking	Tenure-track faculty, promotion-driven academics	Which journals maximize academic prestige and recognition?	Prestige and quality signaling	Citation-based quality; Journal prestige proxies	Accessibility; Scope breadth; Throughput
Global Visibility-Oriented	Policy researchers, interdisciplinary scholars	Where will my work travel globally and be engaged across regions?	International reach and network embeddedness	Geographic diversity; International collaboration	Narrow prestige hierarchies
Balanced Strategic	Mid-career researchers, risk-averse authors	Which journals offer a reasonable trade-off across multiple competing dimensions?	Multi-dimensional balance	Quality, access, reach, scope	Maximizing a single dimension
Global South	Authors from resource-constrained regions	Where can I publish that ensures accessibility, visibility, and legitimacy?	Equity-oriented access and legitimacy	Accessibility; Global reach; Institutional diversity	Prestige signalling; Narrow elitism

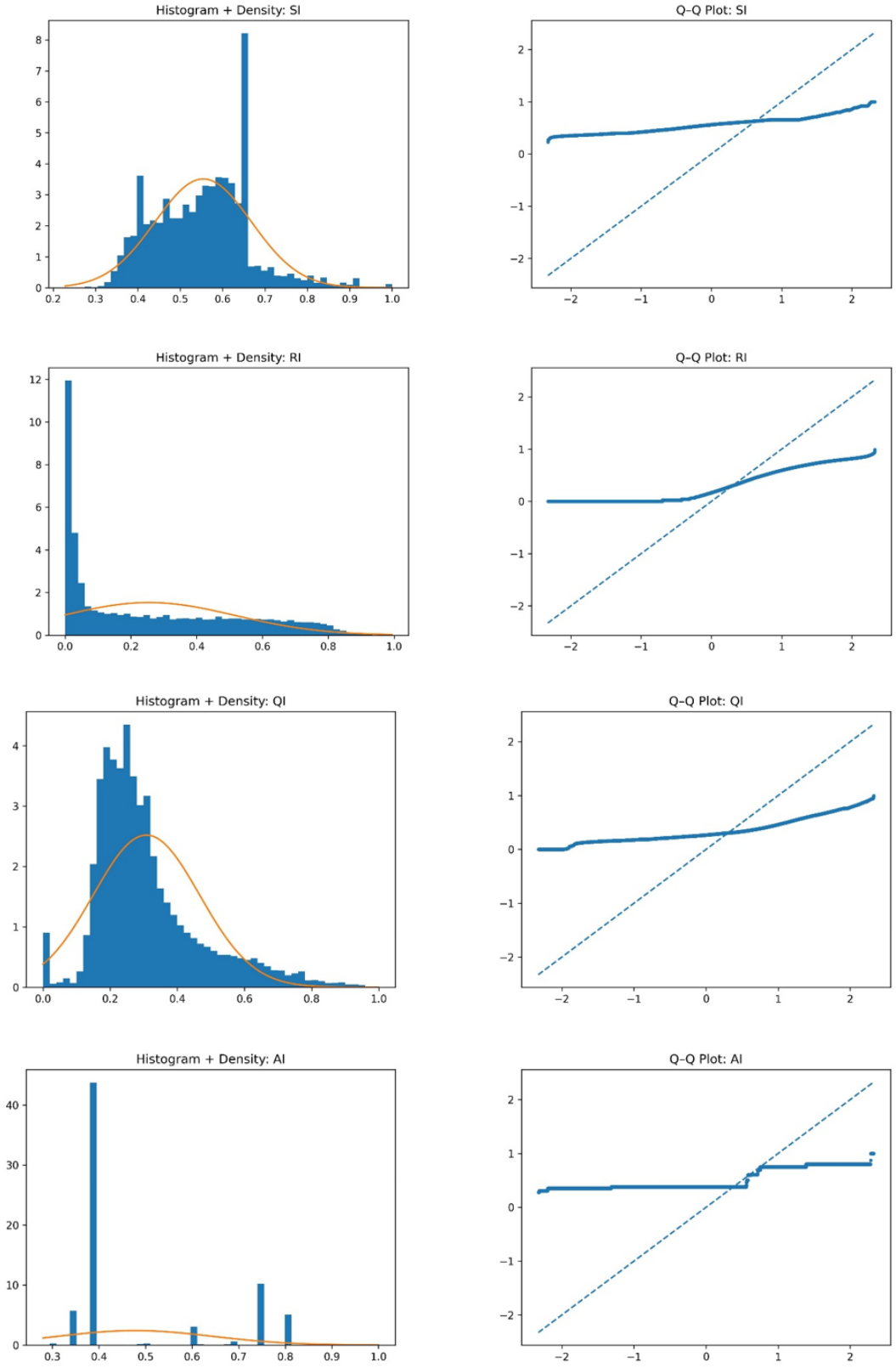

Figure 1: Histogram + Density Plot and Q-Q Plot for Indices.

plots reveal deviations from normality, particularly in the upper quantiles, despite the visually regular histogram.

Relevance Index (RI)

The Relevance Index is highly right-skewed, with a substantial mass near zero and wide dispersion toward higher values. Histogram density and Q–Q plots together confirm pronounced asymmetry and strong deviation from normality

Distributional Properties of Index Constituents

This section provides descriptive statistics and distributional characteristics of the constituent variables underlying each AJSI index.

Accessibility constituents (AI)

Open access type (N_OA) and APC level (N_APC) show moderate central tendency while waiver availability (N_WAIVER) is highly skewed, it shows limited and uneven waiver reporting. All accessibility components deviate significantly from normality.

Quality constituents (QI)

Prestige and citation-based measures (N_SJR, N_CPWTQ, N_CPD5) exhibit, as mentioned in Table 11, strong right skewness and high kurtosis which confirms concentration among a small subset of journals. In contrast, journal age (N_AGE) shows high central values with low dispersion, reflecting widespread journal maturity.

Scope constituents (SI)

Subject breadth (N_CAT) and publication frequency (N_FP) display positively skewed distributions and confirms that highly broad and high-volume journals are relatively uncommon. Sustained publication years (N_YSP) mirrors the age distribution with most journals showing long operational continuity.

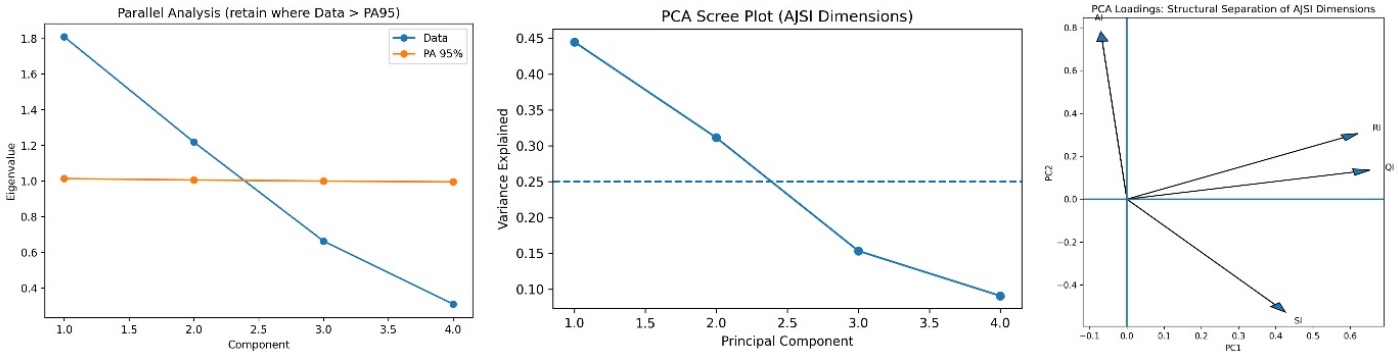

Figure 2: PCA Analysis.

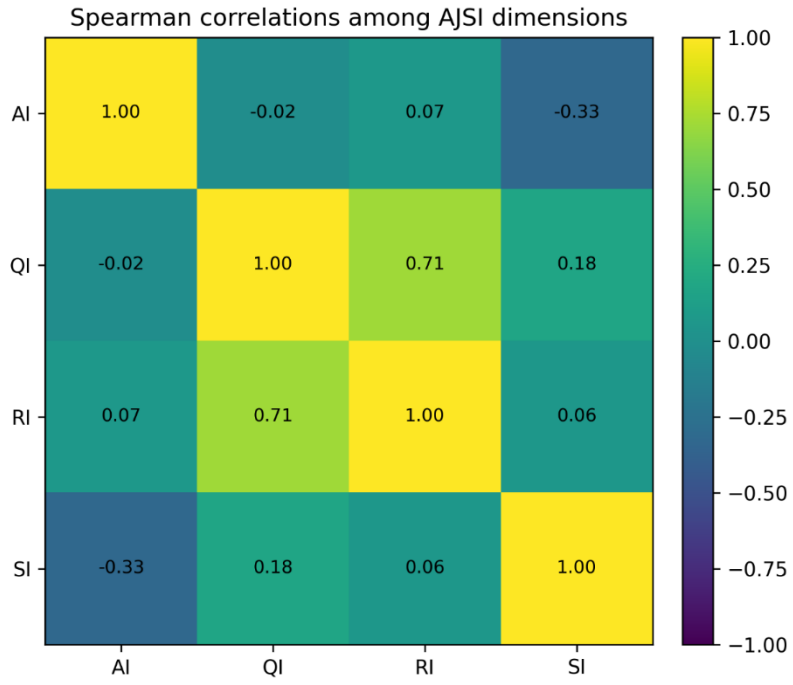

Figure 3: Spearman Correlation between Indices.

Relevance constituents (RI)

Geographic reach (N_GI) and institutional diversity (N_ID) show moderate dispersion while international collaboration (N_IC) remains low for most journals. Self-citation orientation (N_SC) is heavily left-skewed and show generally low self-citation rates with a small number of outliers.

AJSI Indices and their constituents Statistical Validation

PCA and Latent Dimensional Structure of AJSI Indices

This section reports the latent dimensional structure underlying the four core indices using rank-based principal component analysis.

The first two components as depicted in above Table 12 and Figure 2, explain approximately 75.6% of the total variance, indicating a low-dimensional structure. PC1 loads strongly on Quality Index (QI) and Relevance Index (RI) while PC2 is dominated by the Accessibility Index (AI), with an opposing contribution from Scope Index (SI). The remaining components explain limited variance and primarily capture residual contrasts among indices.

The loading configuration shows minimum cross-loading across components, showing clear structural separation among indices. This suggests that the AJSI framework captures a low-dimensional but well-differentiated structure.

Rank-Based Correlation Structure Among AJSI Indices

In this section we report pairwise rank-based associations among the four AJSI indices using Spearman and partial Spearman correlations in this section.

As per above Table 13, the Quality Index (QI) and Relevance Index (RI) exhibit a strong positive association (ρ=0.711) and explains significant shared variance in scholarly stature signals. The Accessibility Index (AI) shows a moderate negative association with Scope Index (SI) (ρ=−0.326) while correlations between AI and both QI and RI remain weak. Partial correlations closely mirror zero-order results.

Robustness analysis using Top-K simulations (K = 200) show high rank consensus with the baseline AJSI across all scenarios (Spearman ρ ≈ 0.93–0.98). Overlap ratios range from 0.52 (accessibility-first) to 0.69 (relevance-first) which shows that ranking outcomes remain stable despite substantial reweighting (Table 14). This confirms that the AJSI rankings are not driven by a single index dominance.

Spearman correlation between indices as visualized in above Figure 3 heatmap concludes that there is a weak inverse relationship between AI and SI. QI and AI are independent of each other. There is a strong positive relationship between Relevance and Quality of journals.

Robustness of Rank Associations Using Confidence Intervals

This section shows confidence intervals for rank-based associations among the four AJSI indices.

The association between Quality Index (QI) and Relevance Index (RI) remains consistently strong as concluded by Table 15 and Figure 4, with narrow confidence bounds, showing high robustness. The negative association between Accessibility Index (AI) and Scope Index (SI) is stable across the interval, while all other index pairs show weak but statistically precise relationships.

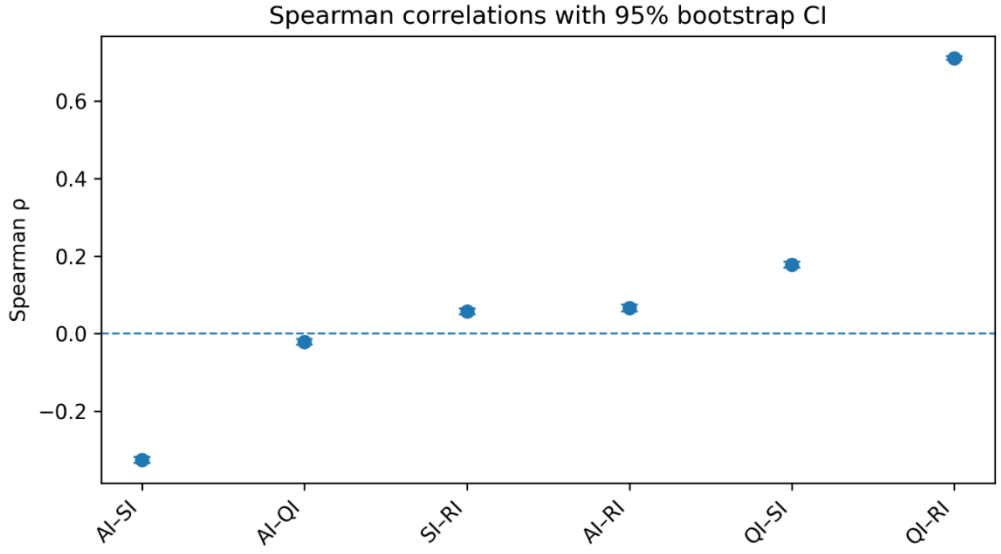

Figure 4: Spearman Correlation CI based.

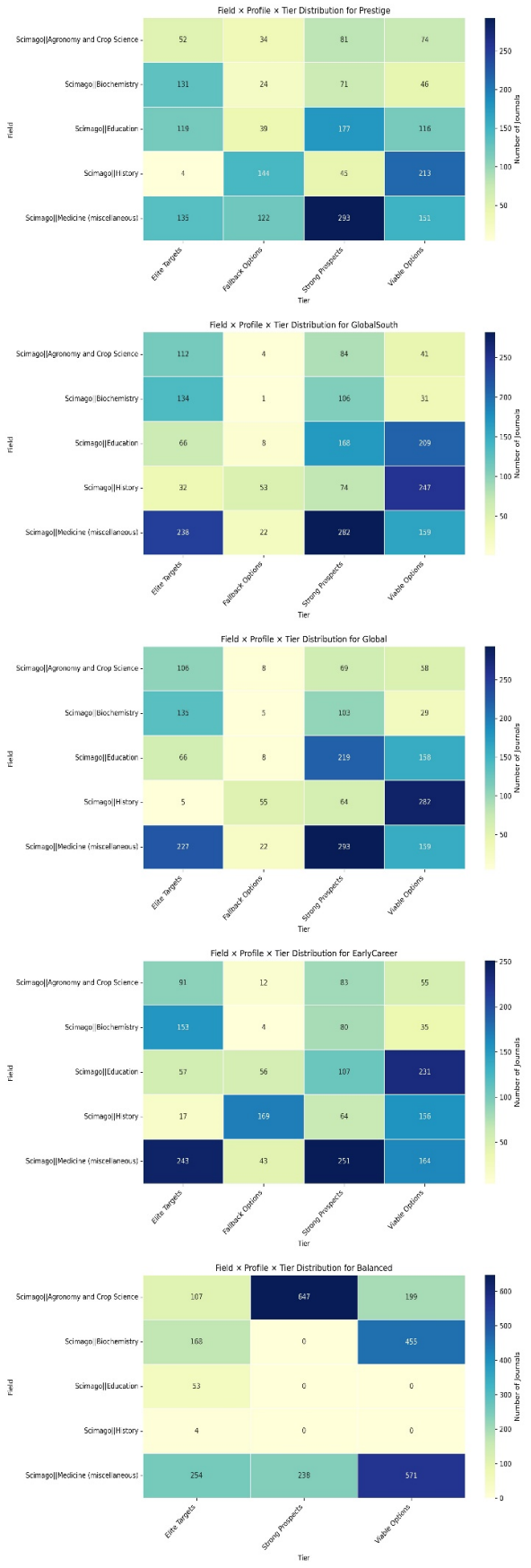

Figure 5: Author Field, Profile and Tier distribution Heatmaps.

These confidence intervals confirm that observed correlation patterns are not driven by sampling variability.

Constituent–Index Association Structure

This section examines the strength of association between each index and its underlying constituent variables using Spearman rank correlations.

For the Accessibility Index (AI), open access type and APC level show, as mentioned in above Table 16, strong positive associations, while waiver availability is negatively related due to its compensatory role. The Quality Index (QI) exhibits very strong associations with prestige and indexing coverage, with journal age showing a moderate contribution.

The Scope Index (SI) shows moderate associations with sustained publication years and publication frequency while subject breadth contributes weakly. The Relevance Index (RI) demonstrates strong associations with geographic reach, institutional diversity and international collaboration while self-citation shows a comparatively weak relationship.

Inter-Constituent Correlation Structure Within Indices

This section examines rank-based associations among constituent variables within each AJSI index.

Within the Accessibility Index (AI), waiver availability shows strong negative correlations with both open access type and APC level indicates its compensatory role. The Quality Index (QI) exhibits high correlations among prestige and citation-based constituents, while journal age shows weak associations, which is clearly visible in Table 17.

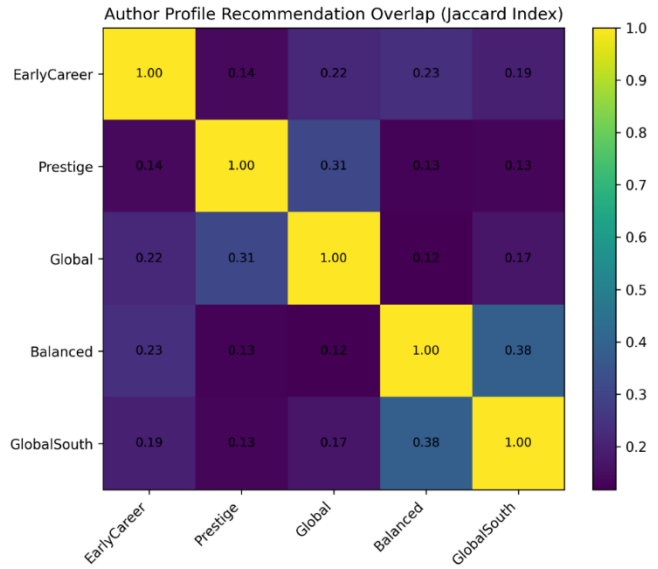

Figure 6: Profile Overlap (Jaccard Index).

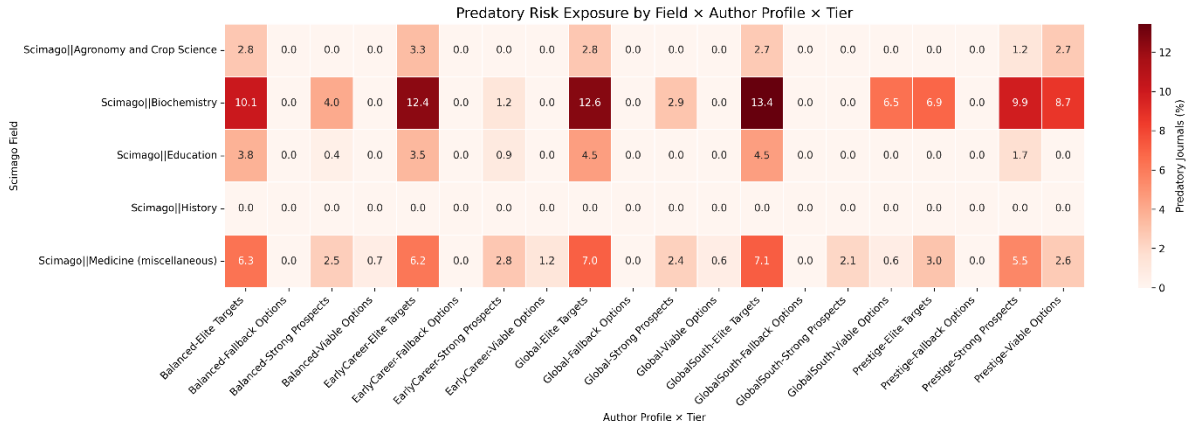

Figure 7: Predatory Risk Exposure by Field x Author Profile x Tier.

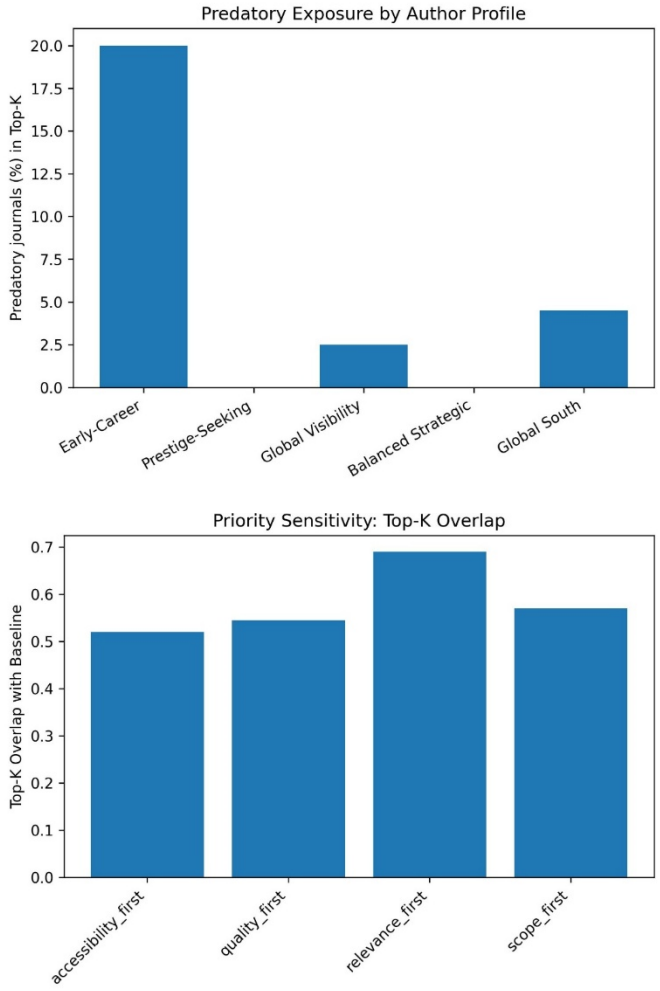

Figure 8: Predatory Risk Exposure by Author Profile.

For the Scope Index (SI), we observed limited internal multicollinearity as constituent correlations are weak. In the Relevance Index (RI), geographic reach (N_GI) shows very strong associations with both international collaboration and institutional diversity, leading to the exclusion of N_ID in favor of N_GI to avoid duplication. Self-citation is weakly associated, so its role remains as an adjustment factor rather than a core driver.

Standardized regression analysis examined the relative contribution of each component to its corresponding index. Components assigned higher conceptual importance generally

exhibited stronger standardized beta coefficients. For instance, citation intensity (β = 0.656) is the dominant contributor to the Quality Index while article processing charges (β = 0.872) and waiver availability (β = 0.757) show the strongest contributions within the Accessibility Index. Similarly, geographic reach (β = 0.737) is the principal contributor to the Relevance Index. These data confirm alignment between theoretical weighting logic and empirical contribution strength.

These empirical checks provide strong support for the validity, interpretability and stability of the component weights.

Table 9: Author profile Score Formula and Weight Justification.

Profile	Formula	Weight Justification
Early-Career	SuitEC=0.35·AI+0.20·QI+0.20·RI+0.15·NFP+0.10·NCAT	AI dominates for accessibility; QI for quality but secondary to feasibility; RI ensures visibility
Prestige-Seeking	SuitP=QI	Quality (QI) is the sole driver; authors prioritize prestige over access or reach
Global Visibility	SuitGV =0.45·RI+0.30·QI+0.25·AI	Relevance dominates for global reach; quality and accessibility are secondary
Balanced Strategic	SuitB=AJSI*	Equal weighting of AI, QI, RI, SI for general-purpose selection
Global South	SuitGS=0.35·AI+0.45·RI+0.10·QI+0.10·NCAT	Heavy weighting on RI and AI to overcome geographic and institutional barriers

Table 10: Descriptive Statistics for Indices.

Index	N	Mean	Median	Std	Min	Max	Skewness	Kurtosis	Shapiro_W	Shapiro_p	KS_stat	KS_p
AI	63005	0.478	0.381	0.165	0.280	1.000	1.108	-0.594	0.631	9.68E-74	0.436	0
QI	63016	0.308	0.267	0.158	0.000	0.999	1.245	1.685	0.893	2.30E-50	0.137	0
SI	63016	0.554	0.562	0.114	0.228	1.000	0.379	0.382	0.973	6.13E-30	0.085	0
RI	63016	0.255	0.168	0.261	0.000	0.994	0.685	-0.874	0.855	1.23E-55	0.167	0

Table 11: Constituents wise Descriptives and Normality.

Index	Constituent	N	Mean	Median	Std	Min	Max	Skewness	Kurtosis	Shapiro_W	Shapiro_p	KS_stat	KS_p
AI	N_OA	63004	0.429	0.250	0.255	0.25	1	0.974	-0.595	0.683	1.29E-70	0.393	0
AI	N_APC	53961	0.567	0.600	0.215	0.1	1	-0.687	1.289	0.674	3.62E-71	0.412	0
AI	N_WAIVER	8616	0.333	0.000	0.471	0	1	0.710	-1.495	0.592	8.38E-76	0.427	0
QI	N_SJR	16450	0.079	0.052	0.094	0.01	1	3.965	22.431	0.642	4.14E-73	0.232	0
QI	N_CPWTQ	63016	0.183	0.040	0.282	0	1	1.790	2.090	0.670	2.07E-71	0.259	0
QI	N_AGE	61321	0.839	0.869	0.155	0	1	-0.957	0.616	0.891	1.15E-50	0.150	0
QI	N_CPD5	63015	0.145	0.017	0.250	0	1	2.110	3.708	0.645	6.19E-73	0.282	0
QI	N_INDEX	63016	0.443	0.500	0.299	0	1	0.228	-0.631	0.901	4.09E-49	0.198	0
SI	N_CAT	63016	0.480	0.400	0.142	0.4	1	1.945	3.061	0.613	1.03E-74	0.378	0
SI	N_YSP	61321	0.839	0.869	0.155	0	1	-0.957	0.616	0.891	1.15E-50	0.150	0
SI	N_FP	36850	0.226	0.129	0.254	0	1	1.915	2.889	0.735	4.89E-67	0.204	0
RI	N_GI	63016	0.294	0.154	0.315	0	1	0.900	-0.447	0.841	2.51E-57	0.177	0
RI	N_IC	63016	0.115	0.051	0.151	0	1	1.798	4.501	0.753	1.26E-65	0.224	0
RI	N_ID	63016	0.295	0.207	0.307	0	1	0.866	-0.364	0.858	2.45E-55	0.168	0
RI	N_SC	16429	0.920	0.952	0.105	0	1	-3.230	15.446	0.690	3.48E-70	0.223	0

Author-Profiling

After statistically validating AJSI, it's indices and constituents of indices now we move to the core of this study the author profiling, profile overlap, profile specific predatory risk and other profiles' rank shifts relative to balance profile.

Author-Profile – Specific Tier Distributions Across Fields

Here, we have demonstrated how journal tier assignments vary across author profiles and disciplinary fields based on profile-specific suitability rankings in this section.

Under the Balanced Strategic profile, journals are distributed in the Strong Prospects and Viable Options tiers across fields and highlights a balanced trade-off between quality, accessibility, relevance and scope. Elite-tier journals remain sparse and unevenly distributed, as shown in Figure 5.

For the Early-Career profile, tier distributions shift more toward the Viable Options and Fallback Options tiers, especially in education and history which reflects greater feasibility-driven decisions under access constraints. Medicine and biochemistry maintain a stronger presence in the upper tiers compared to other fields. The Early-Career profile displays uniformly low overlap with other profiles (all < 0.25).

The Prestige-Seeking profile places journals mainly in the Elite Targets and Strong Prospects tiers with significant field-specific variations. History and medicine demonstrate the highest concentration in elite tiers while agronomy and education have fewer high-tier journals.

In the Global Visibility profile, journals are more concentrated in the Strong Prospects and Viable Options tiers across fields and reflects focus on international reach. Education and history exhibit an increase in the availability of viable-tier journals compared to prestige-focused rankings.

For the Global South profile, tier distributions are centred in the Strong Prospects and Viable Options tiers with a marked decrease in elite-tier concentration across all fields. This is evident in education and history while medicine retains a relatively higher presence in the upper tiers.

Profile-Wise Recommendation Overlap Across Author Types

This section examines the extent of similarity in journal recommendations across author profiles using Jaccard overlap of Top-K journal sets.

Overall, recommendation overlap across profiles remains low to moderate, indicating that profile-specific suitability functions generate meaningfully distinct ranking outcomes. The **Balanced**

Table 12: Principal Component Analysis Results.

	PC1	PC2	PC3	PC4
AI	-0.07005	0.7811	0.6055	-0.1348
QI	0.6535	0.1353	-0.2548	-0.6997
SI	0.4261	-0.5266	0.7350	0.02834
RI	0.6216	0.3067	-0.1676	0.7010

Table 13: Spearman correlations.

Type	Var1	Var2	rho	p
Spearman	AI	QI	-0.0212	1.06E-07
Partial_Spearman	AI	QI	-0.0350	1.37E-18
Spearman	AI	SI	-0.3261	0
Partial_Spearman	AI	SI	-0.3198	0
Spearman	AI	RI	0.0660	1.00E-61
Partial_Spearman	AI	RI	0.0878	5.09E-108
Spearman	QI	SI	0.1781	0
Partial_Spearman	QI	SI	0.1738	0
Spearman	QI	RI	0.7115	0
Partial_Spearman	QI	RI	0.7137	0
Spearman	SI	RI	0.0574	4.10E-47
Partial_Spearman	SI	RI	-0.0665	1.13E-62

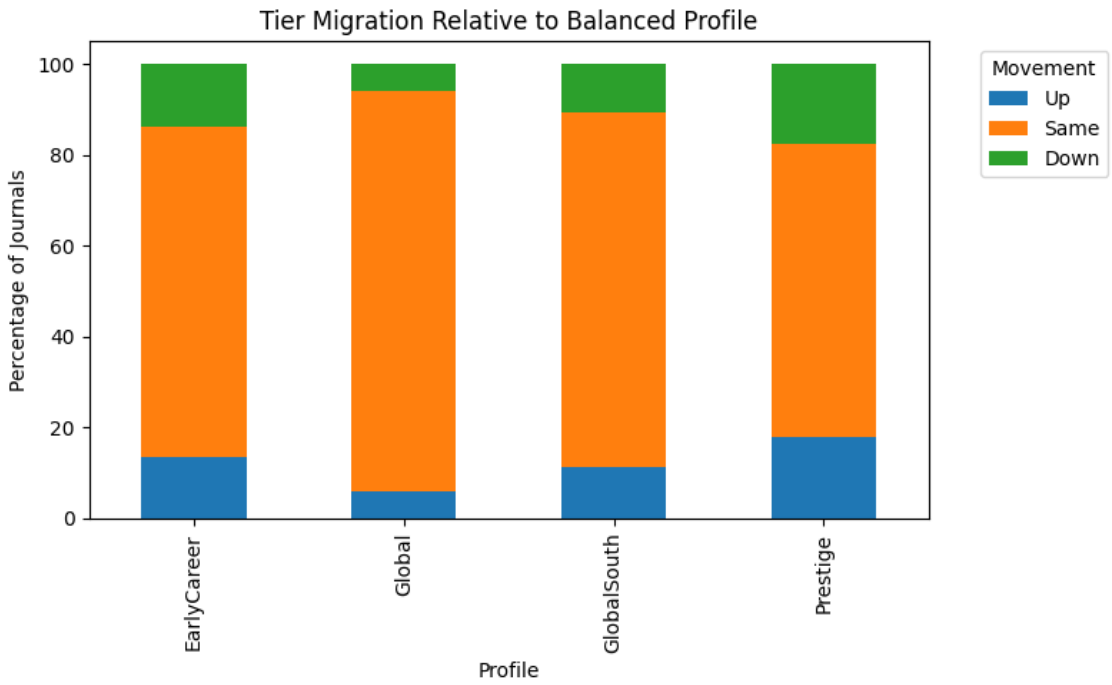

Figure 9: Tier Migration Relative to Balanced Profile (Benchmark Profile (AJSI score).

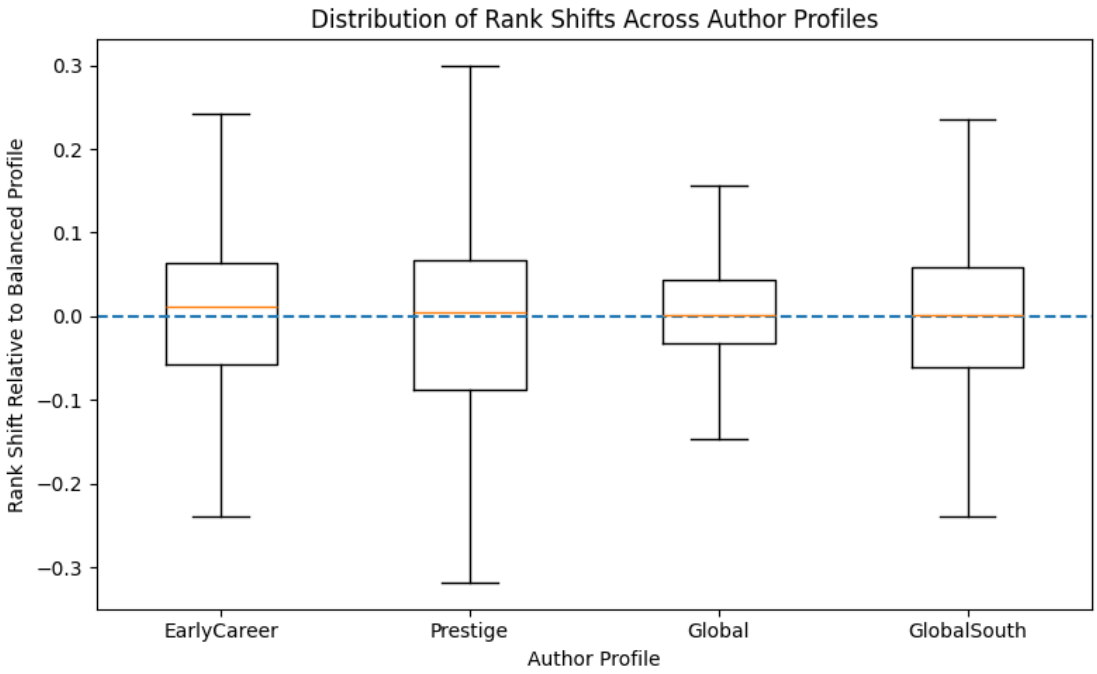

Figure 10: Risk Shifts Distribution Across Author Profiles.

and **Global South** profiles exhibit the highest overlap (Jaccard ≈ 0.38), reflecting partial convergence in journals that satisfy both equity-oriented and multi-dimensional optimization criteria. In contrast, the **Prestige-Seeking** profile shows consistently low overlap with all other profiles (≈ 0.13–0.31), highlighting its strong separation from accessibility- and relevance-oriented decision logics.

Profile-Wise Recommendation Overlap Across Author Types

In this section we examined the extent of similarity in journal recommendations across author profiles using Jaccard overlap of Top-K journal sets.

The overlap in recommendations across profiles remains low to moderate which shows that profile-specific suitability functions

Table 14: Spearman Ranks Scenario based Robustness Analysis.

Scenario	SpearmanRank_vs_Baseline	TopK	TopK_Overlap_Ratio
accessibility_first	0.9484	200	0.52
quality_first	0.9821	200	0.545
relevance_first	0.9826	200	0.69
scope_first	0.9296	200	0.57

Table 15: Robustness of Rank Association between Indices.

Var1	Var2	N_pair	Spearman_rho	CI_2.5	CI_97.5
AI	QI	63005	-0.021	-0.029	-0.013
AI	SI	63005	-0.326	-0.333	-0.319
AI	RI	63005	0.066	0.058	0.075
QI	SI	63016	0.178	0.170	0.186
QI	RI	63016	0.711	0.707	0.716
SI	RI	63016	0.057	0.049	0.065

Table 16: Index-Constituents spearman correlations.

Index	Constituent	Spearman_rho	*p*_value	N
AI	N_OA	0.690	0	63004
AI	N_APC	0.637	0	53961
AI	N_WAIVER	-0.304	2.73E-183	8616
QI	N_SJR	0.843	0	16450
QI	N_CPWTQ	0.893	0	63016
QI	N_AGE	0.344	0	61321
QI	N_CPD5	0.687	0	63015
QI	N_INDEX	0.781	0	63016
SI	N_CAT	0.271	0	63016
SI	N_YSP	0.629	0	61321
SI	N_FP	0.505	0	36850
RI	N_GI	0.967	0	63016
RI	N_IC	0.881	0	63016
RI	N_ID	0.912	0	63016
RI	N_SC	0.145	2.09E-77	16429

lead to clearly distinct ranking outcomes, as shown in Figure 6 heatmap. The Balanced and Global South profiles show highest overlap (Jaccard = 0.38) and it suggests partial convergence in journals that meet both equity-oriented and multi-dimensional optimization criteria. In contrast, the Prestige-Seeking profile consistently shows low overlap with other profiles (= 0.13–0.31), focusing on its distinction from accessibility- and relevance-driven decision-making.

Reflecting a unique recommendation space defined by feasibility and access constraints, the Early-Career profile demonstrates uniformly low overlap with all other profiles (all < 0.25). The overlap between Global Visibility and other profiles is moderate and has selective convergence on internationally connected journals without complete alignment. These scenarios confirm that author profiles create significantly different journal recommendations rather than simply reordering the same journals.

Predatory Risk Exposure and Priority Sensitivity Across Author Profiles

This section analyzes Predatory journal exposure across author profiles and evaluates the sensitivity of Top-K recommendations to changes in optimization priorities.

Predatory exposure varies substantially across author profiles, with Early-Career authors showing the highest share of predatory

Table 17: Inter-Constituents correlations.

Index	Constituent_1	Constituent_2	Spearman_rho	*p*_value	N
AI	N_OA	N_APC	-0.0068	0.11357732	53960
AI	N_OA	N_WAIVER	-0.6130	0	8615
AI	N_APC	N_WAIVER	-0.7909	0	8616
QI	N_SJR	N_CPWTQ	0.8022	0	16450
QI	N_SJR	N_AGE	0.1662	3.25E-102	16441
QI	N_SJR	N_CPD5	0.8188	0	16449
QI	N_SJR	N_INDEX	0.1015	6.68E-39	16450
QI	N_CPWTQ	N_AGE	0.1949	0	61321
QI	N_CPWTQ	N_CPD5	0.7268	0	63015
QI	N_CPWTQ	N_INDEX	0.7433	0	63016
QI	N_AGE	N_CPD5	-0.014	0.00039761	61320
QI	N_AGE	N_INDEX	0.0601	3.75E-50	61321
QI	N_CPD5	N_INDEX	0.7211	0	63015
SI	N_CAT	N_YSP	0.1112	4.06E-168	61321
SI	N_CAT	N_FP	0.1732	3.70E-246	36850
SI	N_YSP	N_FP	-0.0072	0.16429346	36850
RI	N_GI	N_IC	0.8581	0	63016
RI	N_GI	N_ID	0.9353	0	63016
RI	N_GI	N_SC	0.0313	6.03E-05	16429
RI	N_IC	N_ID	0.8055	0	63016
RI	N_IC	N_SC	-0.0210	0.00698128	16429
RI	N_ID	N_SC	0.0898	8.31E-31	16429

Table 18: Tier Migration Author Profile Wise.

Profile	Movement	Journal_Count
EarlyCareer	Down	8724
EarlyCareer	Same	45830
EarlyCareer	Up	8462
Global	Down	3692
Global	Same	55631
Global	Up	3693
GlobalSouth	Down	6788
GlobalSouth	Same	49135
GlobalSouth	Up	7093
Prestige	Down	11068
Prestige	Same	40638
Prestige	Up	11310

journals in their Top-K recommendations while Prestige-Seeking and Balanced Strategic profiles exhibit minimal to near-zero exposure. Global Visibility and Global South profiles show moderate exposure levels as visualized in above Figures 7 and 8 below because of partial risk concentration under access and reach oriented optimization.

Field and tier level analysis depicts that predatory risk is unevenly distributed across disciplines, with higher exposure observed in biochemistry and medicine, particularly within Elite and Strong Prospect tiers under accessibility-constrained profiles. In contrast, humanities-oriented fields show negligible exposure across all profiles and tiers.

Priority sensitivity analysis shows moderate to high stability of Top-K recommendations compared to the baseline as its overlap ratios range from approximately 0.52 to 0.69. Rankings stay stable when relevance is prioritized while accessibility-first configurations lead to more variation.

Tier Migration Patterns Relative to the Balanced Profile

This section reports the direction of journal tier movements for each author profile relative to the Balanced Strategic baseline.

Prestige-Seeking profile exhibits the highest level of tier volatility with comparable numbers of journals moving up and down and shows substantial reordering under prestige-dominant optimization as quantified in Table 18 and Figure 9. In contrast, the Global Visibility profile shows the greatest stability with most journals remaining in the same tier and relatively limited upward or downward movement.

With many journals shifting across tiers in both directions, the Early-Career and Global South profiles show uneven migration patterns. It suggests that feasibility and equity-driven prioritization results in a systematic redistribution of journals compared to the balanced benchmark.

Journals shift rank not because their characteristics change but because different author profiles value those characteristics differently.

Magnitude of Rank Shifts Across Author Profiles

This section reports the extent of rank displacement relative to the Balanced profile across author-centric optimization strategies.

As shown in Figure 10, the Prestige-Seeking profile displays the widest rank-shift dispersion, with significant upward and downward movements which ultimately concludes that journal ordering is highly sensitive to prestige-driven weighting. In contrast, the Global Visibility profile shows a narrower distribution centred near zero which indicates high stability in rankings under relevance-focused optimization.

Summary of Results

These results show that the AJSI framework yields stable yet clearly distinct journal rankings when optimized for various author priorities, with a clear distinction between scholarly stature and author constraint dimensions.

Profile-specific analyses show that changes in optimization logic led to systematic rank reordering and tier migration without disturbing the overall decision framework. These findings confirm that author-centric journal selection is empirically feasible and different from traditional single-metric.

Journal rank shifts occur because different author profiles apply varying weights to the same underlying indices and adjusts the relative importance of accessibility, quality, relevance and scope in the final suitability score. Journals shift up or down tiers only when these adjusted scores exceed fixed percentile thresholds relative to the Balanced baseline due to preference-driven reordering.

DISCUSSION

Reframing Journal Selection as an Author-Centric Decision Problem

Much of the literature frames journal selection around prestige pursuit. Citation-based proxies such as impact factors, ranked lists serve as the dominant stand-ins for journal worth (Hicks *et al*., 2015; Moore *et al*., 2017). Yet authors encounter a wider array of field-specific demands, institutional pressures and resource realities that these proxies routinely fail to register.

The component indices here, separate into distinct axes: quality, relevance, accessibility and scope, do not collapse into interchangeable signals. The close coupling between quality and relevance points to the role citation networks and international visibility play in establishing scholarly position (Bornmann and Haunschild, 2018). Accessibility and scope show only modest alignment which indicates that prestige signals leave large portions of the decision landscape unaccounted for.

So, we treat journal selection as shaped by individual priorities and constraints rather than by any fixed hierarchy. Weighting regimes that vary according to author circumstances, produce reordered lists without losing structural coherence. Similar reframing shows up in recent work that casts journal choice as multi-criteria optimisation rather than unidimensional.

Equity, Accessibility and Global South Considerations

We observed structural inequities continue to affect scholarly publishing remarkably. APCs, uneven indexing coverage, curtailed embargos and restricted international exposure impose heavier burdens on early-career scholars and those in the Global South (Mbaye *et al*., 2022; Nabyonga-Orem *et al*., 2022; Tennant *et al*., 2019). Profile-specific outputs quantify how these constraints alter recommended journals.

The Early-Career and Global South profiles generate significantly different rank distributions relative to the Balanced baseline as it prioritises feasibility alongside legitimacy. Journals favoured under these regimes reduce exposure to financial and infrastructural barriers. The substantial overlap between Balanced and Global South recommendations reinforces the possibility of equity-sensitive selection (UNESCO, 2022). So, equity should be inside core evaluation mechanics rather than as corrective measures.

Sensitivity and Ranking Stability

Weighting choices can destabilise composite rankings, with small perturbations producing large movements (Krantz *et al*., 2022; Seiler and Wohlrabe, 2023). Distinguishing rank-level movement from tier-level migration helps separate changes from different recommendations.

Rank shifts prove extensive in places under Prestige-Seeking parameters. Tier transitions occur less frequently thus preserving the practical stability authors require when shortlisting submission targets (Waltman and Traag, 2020). Combining rank distributions and tier-overlap statistics yields a framework responsive to varied decision logics.

Predatory Risk and Decision Vulnerability

Predatory outlets exploit those constraints funding shortages and time pressure that early-career and resource-limited authors face most acutely (Grudniewicz *et al*., 2019; Cobey *et al*., 2019). Profile comparisons reveal systematic variation in exposure risk.

Early-Career and Global South parameterisations return elevated predatory overlap scores outlining the tension between accessibility needs and safeguard mechanisms. Prestige-Seeking and Balanced profiles show near-zero overlap, illustrating how strong quality and relevance signals function as protective filters. These argue for embedding risk detection within evaluation tools rather than relying on post-hoc exclusion lists (Cobey *et al*., 2019).

Author-Centric Evaluation Beyond Institutional Rankings

Institutional and funding assessments still rely heavily on prestige proxies, often disregarding disciplinary variation and career-stage differences (Hicks *et al*., 2015). AJSI dictates a complementary procedure that prioritize author-level reasoning and trade-off movement.

The framework does not seek to replace existing systems. It instead argues them by offering transparent and adaptable indices that mirror how authors weigh options (Waltman and Traag, 2020).

Author-Centric Versus Discipline-Specific Index Design

The present framework adopts an author-centric rather than discipline-specific orientation because the primary decision problem addressed in this study concerns publication feasibility and strategic suitability at the individual author level. Discipline-specific indices are valuable for benchmarking journals within homogeneous fields; however, they do not adequately capture cross-cutting constraints such as financial accessibility or geographic visibility.

An author-centric design allows the model to accommodate heterogeneous author circumstances while maintaining comparability across disciplines. Moreover, discipline-specific calibration can be incorporated as an extension of the framework through field-normalized inputs without altering the underlying decision logic.

Thus, the author-centric structure does not replace discipline-sensitive evaluation but provides a complementary decision-support mechanism that integrates structural constraints alongside traditional scholarly indicators.

LIMITATIONS OF THE STUDY

We acknowledge several limitations when interpreting the results of the present study.

First, the framework relies on bibliometric metadata derived primarily from OpenAlex, DOAJ and SCImago. Although these sources provide broad global coverage, inconsistencies in reporting practices across publishers may introduce measurement noise in certain variables, particularly waiver availability and publication speed.

Second, the weighting structure reflects a generalizable author-centric logic rather than discipline-specific optimization. While this design enhances comparability across fields, it may not fully capture specialized disciplinary norms such as field-specific citation density or editorial cycles.

Third, the model evaluates journal suitability based on observable structural characteristics rather than manuscript-level factors such as topic novelty, methodological rigor or peer-review outcomes. These factors remain inherently contextual and cannot be standardized at scale.

Finally, the framework is designed as a decision-support tool rather than a deterministic ranking system. The suitability scores should therefore be interpreted as structured guidance rather than definitive prescriptions.

Future research may extend the framework by incorporating discipline-specific normalization schemes, additional editorial process indicators and dynamic updating mechanisms as standardized datasets become available.

The identification of predatory journals in this study relies partly on Beall's List which has been subject to scholarly debate regarding transparency, consistency and potential classification bias. Although this list was used only as a conservative exclusion signal and cross-checked with alternative sources where available, future work may benefit from incorporating standardized, community-validated registries as they become more widely established.

IMPLICATIONS

Implications for Authors

Authors face a broader set of considerations than quality signals alone when selecting publication outlets. Accessibility and scope fit enter strategic calculations in ways that shift meaningfully across career stages and resource contexts (Tenopir *et al*., 2016; Tennant *et al*., 2019). Therefore, we suggest profile-driven rankings for early-career or resource-constrained scholars to identify feasible publication targets that preserve scholarly legitimacy, although predatory risks require explicit attention (Cobey *et al*.,

2019; Nabyonga-Orem *et al*., 2022). Prestige-oriented authors, in turn, gain decision-support tools that avoid assuming uniform hierarchical applicability across disciplines.

Implications for Institutions, Funders and Policymakers

Reliance on prestige metrics in promotion and funding decisions risks disadvantaging groups already facing structural hurdles (Naik *et al*., 2023; UNESCO, 2022). Author-centric indices offer a path toward assessments that accommodate publishing diversity at the same time upholding quality thresholds. Integrating accessibility and relevance dimensions alongside traditional signals could foster more inclusive practices (Hicks *et al*., 2015; Waltman and Traag, 2020).

Implications for Journal Evaluation Systems

Stable tier structures coupled with bounded rank volatility indicate that multi-index designs can support decision guidance without introducing unmanageable instability. This pattern aligns with arguments for pluralistic and transparent alternatives to monolithic scores (Bornmann and Haunschild, 2018; Waltman and Traag, 2020). Such tools function best when they directly parameterise author priorities.

Methodological Implications for Composite Journal Evaluation

As per our analysis, multi-index constructions can preserve conceptual clarity and empirical stability when built with deliberate design choices and thorough validation. Earlier composite schemes have drawn criticism for redundancy among indicators and sensitivity to arbitrary weights (Bornmann and Haunschild, 2018; Donthu *et al*., 2021; Seiler and Wohlrabe, 2023). The present approach counters those issues through separate index definition and percentile-based standardisation (Waltman and Traag, 2020).

Principal component analysis isolates two broad dimensions: one capturing scholarly position via quality and relevance, the other reflecting author-side limitations via accessibility and scope. While bibliometric studies have noted analogous splits, few extend them to large-scale datasets or convert them into usable decision aids (Zhu *et al*., 2022).

Tier assignments remain stable under the Balanced profile, while alternative weighting configurations induce rank reordering that, for the most part, remains bounded within established tiers. Percentile normalization mitigates the distorting influence of outliers and skewed metric distributions that commonly affect citation-derived composite indicators (Waltman and Traag, 2020).

CONTRIBUTIONS OF THE STUDY

In this study, we advance journal evaluation and bibliometric scholarship in many ways. It proposes an author-centric framework that recasts selection as multi-criteria optimisation under individual constraints rather than prestige ordering. It demonstrates that large-scale multi-index evaluation retains interpretability and reliability through careful normalisation and validation steps. It supplies empirical detail on how profile-specific weighting reshapes ranks and predatory exposure. Finally, it quantifies the impact of structural barriers on visibility and risk for early-career and Global South authors, invoking equity-oriented debates.

CONCLUSION

We introduced and validated the Author-Centric Journal Selection Index as a decision-support construct that models journal choice as author-dependent rather than universal. AJSI captures contemporary publishing realities more fully than prestige-dominant approaches by incorporating accessibility, quality, scope and relevance under flexible parameterisations. The resulting rankings exhibit stability at the tier level while allowing controlled differentiation according to priorities and constraints. We believe disregarding author-specific factors risk evaluation tools from the decisions they purport to inform. The relevant question shifts from identifying universally superior journals to determining which outlets best suit a given author and under conditions.

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ABBREVIATIONS

AJSI: Author-Centric Journal Selection Index; **AI:** Accessibility Index; **QI:** Quality Index; **SI:** Scope Index; **RI:** Relevance Index; **OA:** Open Access; **APC:** Article Processing Charges; **DOAJ:** Directory of Open Access Journals; **SJR:** SCImago Journal Rank; **MCDA:** Multi-Criteria Decision Analysis; **PCA:** Principal Component Analysis; **ISSN:** International Standard Serial Number; **DOI:** Digital Object Identifier; **WoS:** Web of Science; **CPD:** Citations per Document; **N_OA:** Normalized Open Access Score; **N_APC:** Normalized APC Score; **N_WAIVER:** Normalized Waiver Score; **N_SJR:** Normalized SJR Score; **N_INDEX:** Normalized Indexing Coverage Score.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

AUTHOR CONTRIBUTIONS

Conceptualization, Nishant Joshi.; Methodology, Nishant Joshi.; Data curation, Nishant Joshi; Formal analysis, Nishant Joshi; Validation, Dr. Mayank Bhatia; Visualization, Nishant Joshi; Writing original draft, Dr. Mayank Bhatia; Writing review and editing, Nishant Joshi. All authors have read and agreed to the submitted version of the manuscript.

AI-assisted tools (including Grok) were used for language refinement, code debugging, plots generation support. All analytical decisions, data interpretation, and theoretical arguments were developed and validated by the authors. Tools like R Studio, Python and Zotero are used for data cleaning, meta data extraction, and statistical calculations.

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