

WoS or Scopus? Regional Patterns and Hungarian Dilemmas in Scientific Visibility

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Abstract

This study examines how differences between the two leading bibliometric databases – Web of Science (WoS) and Scopus – are reflected in the publication practices of EU member states and Hungarian higher education institutions. The findings reveal distinct regional patterns: while Western European countries are generally more WoS-oriented, Central and Eastern European countries tend to favour Scopus. The Hungarian institutional data underscore that database preference is not merely a technical choice, but a question of science policy and strategic positioning, with implications for international visibility and evaluability. A comparative example of two universities – Széchenyi István University and the University of Miskolc – demonstrates how different database alignments can lead to contrasting evaluations of scientific output. The final section offers recommendations for improving publication strategy, science communication, and national-level support mechanisms.

CCS Concepts

• Publishing; • Sociology; • Digital libraries and archives;

Keywords

Bibliometrics, Web of Science, Scopus, Regional differences, Hungarian higher education, Publication strategy, Scientific visibility

ACM Reference Format:

Noemi Hajdu and Peter Sasvari. 2025. WoS or Scopus? Regional Patterns and Hungarian Dilemmas in Scientific Visibility. In *Central and Eastern European eDem and eGov Days 2025 (CEEeGov 2025)*, December 03–05, 2025, Bucharest, Romania. ACM, New York, NY, USA, 7 pages. <https://doi.org/10.1145/3773002.3773008>

1 Introduction

Global scientometric databases—particularly Web of Science (WoS) and Scopus—play a pivotal role in evaluating academic performance and enhancing the international visibility of institutions. These platforms are not just repositories, but systems that influence science policy, rankings and even resource allocation. [1] [2].

In recent years, many countries have aligned publication strategies with ranking logics. However, these rankings rely on different data sources: QS and Times Higher Education use Scopus, while ARWU and U.S. News use WoS. This divergence has structural effects, shaping database preferences and publishing practises. [3] [4]. Although some studies refer to three major databases in certain fields (e.g. WoS, Scopus and PubMed in the biomedical sciences), our empirical analysis focuses on the two leading interdisciplinary databases WoS and Scopus. References to “three databases” in the literature review are therefore contextual, while the comparative results presented here are limited to the differences between WoS and Scopus.

We analyse the regional patterns of WoS and Scopus usage in the EU27 and assess their impact on the visibility of Hungarian universities. We aim to examine the spatial structure of these divergences, identify the institutional and science policy factors behind them, and assess how such differences influence publication-based evaluations, ranking outcomes, and academic reputation in the Hungarian context.

The first part provides an overview of publication trends in the EU27, emphasising East-West contrasts and the case of Romania. We then analyse the 2024 publication data of Hungarian universities in WoS and Scopus, focusing on institutions such as Széchenyi István University and the University of Miskolc, where significant discrepancies appear between the two databases. Our central question is simple and yet urgent: can the performance of institutions be adequately assessed using a single database?

2 Theoretical framework and literature review

Web of Science (WoS) and Scopus are the world’s two leading scientific databases and serve as essential tools for evaluating research output and conducting scientometric analyses. Both rely on peer-reviewed literature, but they differ substantially in terms of coverage, document types indexed, impact indicators, and the underlying logic of selection and indexing [5] [6].

WoS offers longer temporal coverage, dating back to 1900, while Scopus began indexing in 1996. However, Scopus includes a broader range of document types—such as book chapters, conference proceedings, and technical reports. This is especially relevant in fields like engineering, information technology, and applied sciences, where scholarly communication often takes place through conferences [7] [8]. Meho and Sugimoto [9] support this by showing that citation patterns and topical coverage differ markedly between the



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ACM ISBN 979-8-4007-2197-7/2025/12

<https://doi.org/10.1145/3773002.3773008>

two databases, depending on the discipline. Scopus adopts a more inclusive selection policy for conference proceedings—regularly indexing series published by IEEE, ACM, or Springer’s Lecture Notes in Computer Science (LNCS)—while WoS applies stricter criteria through its Conference Proceedings Citation Index [6].

Differences in journal coverage also become evident when analysed by impact quartiles (Q1–Q4). According to Scimago (2024) [10], Scopus indexes 28,175 journals, of which 17,943 (64%) are also included in WoS. Yet the overlap is uneven across quartiles:

- Among Q1 journals—the most prestigious—84% of Scopus-indexed titles also appear in WoS (7,268 out of 8,650).
- This overlap drops to 74% in Q2 and further to 56% in Q3.
- In Q4, the overlap declines sharply to just 29%.
- For journals without quartile rankings, the overlap is only 22%.

This pattern indicates that WoS tends to prioritise journals with higher prestige and stable impact, while Scopus includes more emerging, lower-impact, or less frequently cited publications [11] [12]. These differences are further supported by empirical studies. Aksnes and Sivertsen [13] offer a detailed, criteria-based comparison of WoS and Scopus, highlighting disciplinary and quality-related divergences.

The impact metrics used by the two platforms also differ. WoS relies on the Journal Impact Factor (JIF) calculated by Clarivate, often regarded as the gold standard in academic assessment and university evaluation. Scopus, by contrast, offers several alternative metrics—including CiteScore, SJR, and SNIP—which account for interdisciplinarity and normalised citation rates [14].

In this context, publishing is not just about dissemination, but a strategic act that influences visibility, rankings and funding opportunities. It is not surprising that the excessive use of metrics is increasingly being criticised. The Leiden Manifesto [15] and the DORA declaration [16] both call for more multidimensional, qualitative, and context-aware approaches to evaluating researcher performance.

This analysis uses publication data from 2024, as its currency and completeness allow for the identification of up-to-date patterns and meaningful comparisons.

In line with the above, this study addresses three key research questions:

- What regional differences can be identified in the use of WoS and Scopus in EU27 countries?
- How do database preferences influence the international visibility of Hungarian higher education institutions?
- Can the evaluation of academic performance be considered biased if based solely on one database?

3 Methodology

This study is based on publication data extracted from the Web of Science (WoS) and Scopus international scientific databases, with particular emphasis on the year 2024. The main objective was to explore the extent of discrepancies in the number of publications recorded in the two databases—both at the national and institutional levels—and to assess how these differences affect the international scientific visibility of the entities concerned.

Previous research has already highlighted the importance of bibliometric comparisons. For example, Alryalat, Malkawi, and Momani [17] analysed the structural differences among the three leading databases used to measure scientific performance.

In our international analysis, we focused on the 27 Member States of the European Union (EU27), using aggregated national-level data. For each country, we compared the number of scientific publications indexed in WoS and Scopus in 2024. The key metric used was the proportional difference between the databases, calculated relative to WoS values using the following formula:

$$Difference = \frac{Scopus - WoS}{WoS}$$

Using this metric, we first conducted a descriptive statistical analysis. We then performed a hierarchical cluster analysis to group countries according to their publication profiles. The clustering was based on the 2024 proportional differences and applied Ward’s method. The results were visualised as a dendrogram titled Clustering of EU27 countries based on Scopus–WoS publication gap (2024), which provides a visual representation of the similarity between national publication patterns.

In analysing Hungarian universities, we included all institutions that had at least one scientific publication indexed in both WoS and Scopus in 2024. The sample comprised 22 higher education institutions. Below is the full list of universities included, presented in alphabetical order along with their abbreviations: University of Veterinary Medicine Budapest – ÁOE, Corvinus University of Budapest – BCE, Budapest Business School – University of Applied Sciences – BGE, Budapest Metropolitan University – METU, Budapest University of Technology and Economics – BME, University of Debrecen – DE, Dunaújváros University – DUE, Eötvös Loránd University – ELTE, Eszterházy Károly Catholic University – EKKE, Károli Gáspár University of the Reformed Church in Hungary – KRE, Hungarian University of Agriculture and Life Sciences – MATE, University of Miskolc – ME, Ludovika University of Public Service – NKE, John von Neumann University, Óbuda University – OE, University of Pannonia – PE, Pázmány Péter Catholic University – PPKE, University of Pécs – PTE, Semmelweis University – SE, University of Sopron – SOE, Széchenyi István University – SZE, University of Szeged – SZTE.

For the institutional analysis, we again relied on descriptive statistics. The number of publications indexed in WoS was compared with those found in Scopus, and based on the differences, we assessed each institution’s alignment with either database. These findings were then interpreted in terms of science policy implications, particularly focusing on how such visibility discrepancies may affect the institutional reputation and its positioning in international rankings.

We have favoured the 2024 data for the institutional comparison of the EU27 and Hungary to ensure timeliness and policy relevance. Annual fluctuations caused by the pandemic and the post-pandemic period could otherwise obscure recent visibility patterns.

However, for the cluster analysis, we aggregated the 2021–2024 data to improve temporal stability. Multi-year aggregation reduces the influence of one-off shocks and leads to more robust grouping structures. This mixed strategy thus strikes a balance between

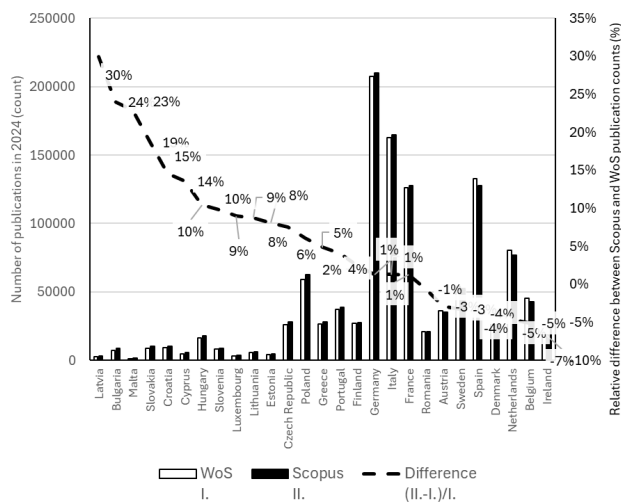


Figure 1: Publication Count Differences between Scopus and Web of Science in EU27 countries, 2024. The metric is calculated as $(\text{Scopus} - \text{WoS})/\text{WoS}$, with negative values indicating a WoS-oriented profile and positive values indicating a Scopus-oriented profile. (Author’s compilation based on WoS and Scopus data)

timeliness and reliability and improves the interpretability of the results at both national and institutional levels.

4 Regional Patterns among EU27 Countries

A comparative analysis of the 27 Member States of the European Union reveals substantial differences in the proportion of scientific publications indexed in the Web of Science (WoS) and Scopus databases. According to 2024 data, these differences are not only significant in quantitative terms but also display clear regional patterns. They reflect not only divergent publication practices, but also deeper science policy orientations and strategic priorities.

The percentage differences in publication counts between WoS and Scopus are illustrated in Figure 1. Negative values indicate a dominance of WoS, while positive values reflect a relative prevalence of Scopus-indexed publications. Many Central and Eastern European countries show stronger Scopus dominance than the EU average, while Western European countries tend to have a more balanced or WoS-oriented publication profile.

This divergence is not merely technical in nature, but also rooted in science policy considerations. Hazelkorn and Gibson [1] have pointed out that the logic of global rankings has become increasingly intertwined with institutional publication strategies, shaping researcher behaviour in the process. Since the QS and Times Higher Education (THE) rankings rely on Scopus data, while the Academic Ranking of World Universities (ARWU) and the U.S. News Best Global Universities rankings are based on WoS, countries and institutions adapt their visibility strategies accordingly [2] [4]. Based on proportional differences, four main groups of countries can be identified:

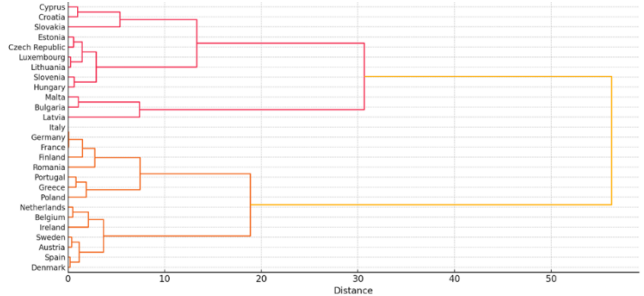


Figure 2: Hierarchical clustering of EU27 countries by Scopus-WoS publication gap, 2021-2024. Distances are based on proportional differences and Ward’s linkage method. Clusters reflect similarities in multi-year publication profiles rather than absolute levels (Author’s compilation based on WoS and Scopus data)

1. WoS-oriented countries (negative difference): Ireland, Belgium, the Netherlands, Denmark, Spain, Sweden, Austria, and Romania – predominantly Western European countries with high-performing university systems, with Romania being a notable exception.
2. Balanced countries ($\pm 1-2\%$): France, Germany, Italy, and Finland – where the differences between the two databases are minimal and national science policies support diversified publication practices.
3. Moderate Scopus advantage (3–10%): Portugal, Greece, Poland, the Czech Republic, Estonia, Lithuania, Luxembourg, Slovenia, and Hungary.
4. Strong Scopus dominance (over 10%): Cyprus, Croatia, Slovakia, Malta, Bulgaria, and Latvia – where applied sciences, conference-driven publishing, and easier access to Scopus-indexed journals offer a significant advantage.

Romania is a notable exception.

While most Central and Eastern European countries have a strong Scopus orientation, Romania shows a relatively WoS-heavy profile. This could be due to a combination of factors: (i) a strong clinical and medical research base, which has always been associated with WoS-indexed journals; (ii) evaluation practises that have long favoured Journal Impact Factor (JIF) deals; and (iii) effects of subject composition, especially in the life sciences and chemistry, where WoS coverage is denser. These mechanisms cannot be confirmed at the micro level without author and distribution data, but they offer plausible explanations for Romania’s deviation from the general regional trend.

4.1 Results of the cluster analysis

In addition to the 2024 dataset, a hierarchical cluster analysis was conducted using data from 2021 to 2024 across the 27 EU Member States. The objective of this analysis was to identify groups of countries with similar relative differences in the representation of publications in Scopus and Web of Science. The resulting dendrogram is presented in Figure 2.

The dendrogram reveals distinct clusters of countries with similar publication profiles. For instance, one cluster includes countries

where Scopus has a pronounced dominance (e.g., Bulgaria, Latvia, Hungary, Malta), while another group comprises countries with a strong orientation toward WoS (e.g., Austria, Belgium, Sweden, Spain, Denmark). These findings support the notion that database preferences are influenced not only by disciplinary considerations, but also by geographical and institutional factors.

4.2 Different implications for science policy

The differences identified above carry important implications for science policy. Since major global university rankings are based on different data sources (e.g., QS and THE rely on Scopus, while ARWU and U.S. News are based on WoS), countries and institutions may be assessed and represented differently depending on the ranking. This may distort the international perception of competitiveness and performance, and underscores the importance of institutional-level policy decisions that take database orientation into account.

Although the current study focuses on EU27 countries, similar disparities have been observed in other regions as well. For example, Alonso-Álvarez [18] reported significant variations in the representation of African journals across WoS, Scopus, and regional databases, highlighting how database selection shapes scholarly visibility.

5 The publication profile of the Hungarian higher education system in 2024: national and institutional data

Building on the international comparison, similar structural differences can be observed when analysing the presence of Hungarian higher education institutions in the Web of Science (WoS) and Scopus databases. According to 2024 data, there are 22 Hungarian universities whose scientific publications are indexed in both databases. However, the distribution of publications—and the scale of discrepancies—varies significantly across institutions (Figure 3). At the institutional level, the gap between Scopus- and WoS-indexed publications ranges from −8% at Semmelweis University (SE) to +480% at Széchenyi István University (SZE). The most striking Scopus dominance is seen at SZE, Dunaújváros University (DUE), and Károli Gáspár University (KRE), which have a research focus on applied sciences, engineering, economics, and social sciences—disciplines that typically favour Scopus-oriented publication strategies.

In contrast, institutions such as Semmelweis University (SE), the University of Veterinary Medicine Budapest (ÁOE), and, to a lesser extent, the University of Szeged (SZTE), exhibit more balanced or slightly WoS-dominant profiles. These universities are closely affiliated with high-ranking journals in medicine, life sciences, and natural sciences—fields more strongly represented in the WoS database.

5.1 Two case studies: Széchenyi István University and the University of Miskolc

Despite their similarities in size, programme structure, and disciplinary focus, Széchenyi István University (SZE) and the University of Miskolc (ME) exhibit markedly different publication profiles.

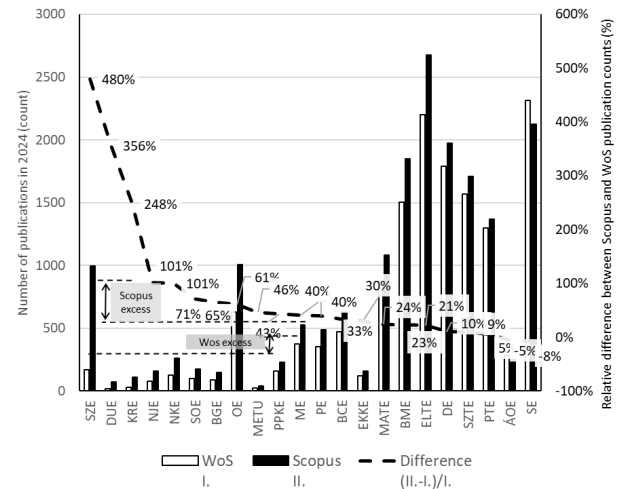


Figure 3: Publication output of Hungarian universities in 2024 indexed in Scopus and Web of Science. Bars show total counts per database; labels report proportional differences calculated as $(\text{Scopus} - \text{WoS})/\text{WoS}$. (Author’s compilation based on WoS and Scopus data)

Both institutions offer degrees in engineering, IT, economics, and social sciences and play a prominent role in their respective regions. Yet, in 2024, SZE produced nearly twice as many Scopus-indexed publications as ME, while ME outperformed SZE by more than twofold in WoS-indexed output (Table 1).

These differences are not primarily a reflection of research productivity, but rather of divergent publication strategies. While ME appears to prioritise international journals with impact factors, SZE likely focuses on Scopus-indexed conference proceedings, open-access outlets, and practice-oriented publication channels.

5.2 Cluster analysis: Grouping Hungarian universities based on publication differences

To better understand institutional-level variation, a hierarchical cluster analysis was carried out based on the relative difference between Scopus and WoS publication counts. The resulting dendrogram groups universities by similarity in publication strategy (Figure 4).

Three major clusters can be identified:

- **Scopus-oriented cluster:** Széchenyi István University (SZE), Dunaújváros University (DUE), and Károli Gáspár University (KRE) show a clear preference for Scopus, with visibility in that database significantly exceeding that in WoS.
- **WoS-centred or balanced cluster:** Institutions such as Semmelweis University (SE), the University of Debrecen (DE), the University of Szeged (SZTE), the University of Pécs (PTE), and the University of Veterinary Medicine (ÁOE) fall into this group, where WoS-indexed publications either dominate or are roughly equal in number to those indexed in Scopus.
- **Intermediate cluster (moderate Scopus preference):** This includes Budapest University of Technology and Economics

Table 1: Comparative publication output of Széchenyi István University (SZE) and the University of Miskolc (ME) in 2024. The figure contrasts WoS- and Scopus-indexed publications to illustrate how database orientation produces divergent visibility profiles (Author’s compilation based on WoS and Scopus data)

Rank	Name of the University	Abbreviation	Wos I.	Scopus II.	Difference
1	Széchenyi István University	SZE	172	997	+480%
11	University of Miskolc	ME	376	528	+40%

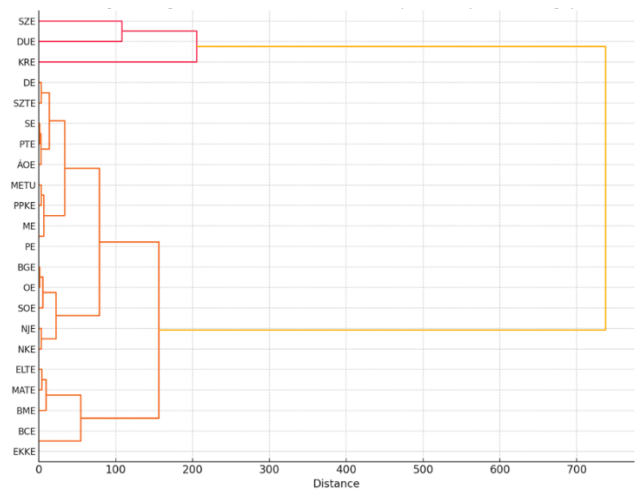


Figure 4: Hierarchical clustering of Hungarian universities based on their Scopus–WoS publication gap, 2024. Distances are calculated using Ward’s linkage method. Clusters suggest institutional alignment strategies: Scopus-oriented, WoS-centred/balanced, and intermediate (Source: Author’s compilation based on WoS and Scopus data)

(BME), Eötvös Loránd University (ELTE), the Hungarian University of Agriculture and Life Sciences (MATE), and Pázmány Péter Catholic University (PPKE). Although these institutions show more balanced profiles, a slight shift toward Scopus is evident.

These clusters reinforce the interpretation that publication database selection in Hungarian higher education reflects deliberate strategic decisions with substantial implications for institutional visibility and evaluability.

Interestingly, the clustering also shows a partial geographical logic: many regional universities outside the capital tend to cluster together, while the large research-intensive universities located in Budapest form a distinct group. In addition, shared scientific priorities—such as a focus on applied or technical disciplines—also appear to shape clustering patterns.

6 Institutional Visibility, Rankings, and Strategic Consequences

The distribution of publication output across major bibliometric databases is not merely a technical matter; it plays a decisive role in shaping the international visibility of institutions, their positioning in global rankings, and their strategic flexibility. The choice between Scopus and Web of Science (WoS) affects not only the channels of scientific communication but also how institutions can be evaluated externally.

6.1 Visibility Discrepancies in Practice

As detailed in Chapter 5, the comparison between Széchenyi István University (SZE) and the University of Miskolc (ME) illustrates how considerable disparities can emerge between institutions of similar size and academic focus, depending on their database orientation. While SZE demonstrates a strong presence in Scopus, its WoS representation is much lower. The opposite pattern is seen at ME. These differences do not necessarily reflect variations in research productivity, but rather divergent publication strategies and preferred outlets.

6.2 International Rankings and the Limits of Evaluability

These publication-based differences have direct consequences for universities’ positions in global rankings. Although rankings such as QS and Times Higher Education (THE) incorporate multiple indicators, scientific visibility remains a prerequisite for inclusion. A strong presence in Scopus can enhance performance in QS and THE rankings—particularly when accompanied by high citation impact and internationalisation metrics. Conversely, institutions more strongly represented in WoS may perform better in rankings like the Academic Ranking of World Universities (ARWU, or Shanghai Ranking) and the U.S. News Best Global Universities, both of which are grounded in WoS data.

Notably, neither SZE nor ME currently appears in the ARWU or U.S. News rankings. In contrast, the University of Debrecen (DE), the University of Szeged (SZTE), and the Budapest University of Technology and Economics (BME) are consistently featured. Both DE and SZTE are represented in all three major rankings (ARWU, QS, THE), while BME achieves particularly strong results in ARWU and QS, especially in engineering and technology-related fields. This contrast illustrates how database orientation can shape an institution’s international visibility and perceived standing.

Given its stronger publication base in WoS-indexed journals with impact factors, ME would likely achieve a more favourable position than SZE in WoS-based ranking systems—should it be included. In contrast, SZE’s visibility rests largely on Scopus, often through conference proceedings and open-access outlets, which are not always recognised in WoS-dependent ranking methodologies.

6.3 Strategic and science policy implications

The findings of this study have broader implications at both institutional and system levels:

- Database orientation can distort visibility profiles, reflecting indexing priorities rather than genuine research performance. This aligns with broader critiques of global rankings, which may present an incomplete or misleading picture of institutional excellence [19].
- Evaluation systems tied to international rankings influence decisions about funding, accreditation, and recognition. Institutions whose performance metrics align poorly with ranking methodologies may be disadvantaged.
- The WoS–Scopus divide should not be viewed solely as a bibliometric issue, but also as a matter of institutional science communication and academic branding.
- National science policy must reconsider how institutional excellence is defined, particularly in an international context where visibility depends on database preferences as much as on scientific merit.

Previous research has shown that Scopus-based indicators—especially those related to visibility and citation impact—are strong predictors of an institution’s QS ranking position [2]. At the same time, Hungarian media have increasingly emphasised that university reputation cannot be reduced to ranking scores alone [20]. In general, all global rankings are linked to normative decisions - from the selection of indicators to weighting- that influence the perception of institutions. This logic does not only apply to universities: city rankings, for example, also reflect underlying priorities and value judgements. Recognising these structural biases helps universities to interpret their ranking positions more critically and develop strategies that highlight strengths that are not fully captured by conventional metrics.

6.4 Social embedding of database decisions

Apart from institutional incentives, publication strategies are also characterised by social and generational factors. Cohort effects often play a role: younger researchers may favour quick visibility through Scopus-indexed conference proceedings and open access journals, while older researchers tend to rely on established WoS-indexed journals with stable impact factors. The geographical location of doctoral training can reinforce these orientations. For example, researchers trained in quantitative traditions in the US often publish in Scopus-indexed conference series in engineering and computer sciences, while researchers working in clinical sciences and life sciences are more closely associated with the WoS and its Journal Impact Factor (JIF) ecosystem. These generational and educational influences interact with disciplinary norms, career status incentives and national assessment rules, and together reinforce the regional and institutional patterns identified in our analysis.

Although systematic evidence for these mechanisms remains limited, our findings are consistent with such dynamics and point to promising avenues for future research.

7 Conclusions and recommendations

This study analysed how WoS scopus differences influence publication practices in the EU27 and at Hungarian universities. Based on the findings, the following key conclusions and recommendations can be drawn.

7.1 Main conclusions

- Regional disparities in database representation. Significant differences exist across EU27 countries in terms of the number of publications indexed in WoS and Scopus. These disparities reflect variations in national science policies and publication cultures. In many Central and Eastern European countries, Scopus-indexed publications outnumber those in WoS.
- Institutional-level differences in Hungary. Even among Hungarian universities of comparable size and disciplinary profile, substantial variation exists in database orientation. Some institutions (e.g. Széchenyi István University – SZE) show a marked preference for Scopus, while others (e.g. University of Miskolc – ME) publish more extensively in WoS-indexed journals.
- Database-driven visibility and evaluability. These differences have a direct impact on how universities are presented in rankings. The shifts often reflect the focus on databases, not necessarily research quality.
- Cluster patterns show strategic decisions. The analyses reveal different groups, which indicates that the preferences in the database are based on conscious strategies and not on chance.

7.2 Recommendations

- Regular review of publication strategies. Institutions should periodically assess where their publication output is indexed and whether this aligns with strategic objectives—such as improving ranking positions, enhancing international visibility, or meeting national science policy goals.
- Raising awareness among researchers. Academic staff should be aware that the choice of publications is not only scientific, but also strategic. The visibility of the database has an impact on evaluation and funding opportunities.
- Strengthening science communication and academic branding. Universities—especially those that are less visible in rankings—should use proactive communication strategies to promote their research and strengthen global positioning.
- National-level support to improve visibility. Targeted funding programmes could help Hungarian institutions gain greater visibility in both WoS- and Scopus-based rankings. Such initiatives would contribute to a more balanced international representation and strengthen the global competitiveness of Hungarian research.

Acknowledgments

Project no. TKP2021-NKTA-51 has been implemented with the support provided by the Ministry of Culture and Innovation of Hungary from the National Research, Development and Innovation Fund, financed under the TKP2021-NKTA funding scheme.

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