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Mining and Mineral Processing Journals in the WoS and Their Rankings When Merging SCIEx and ESCI Databases—Case Study Based on the JCR 2022 Data

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Abstract: The 2022 JCR included ESCI journals for the first time, increasing the number of publication titles by approximately 60%. In this paper, the subcategory Mining and Mineral Processing (part of the Engineering and Geosciences category, where 12 of the ESCI journals were merged with the 20 SCIEx ones) is presented and analyzed. Only three of the ESCI journals included in the database were ranked Q1/Q2. The inclusion of the entire ESCI added new content for readers and authors relying on JCR sources. This paper offers authors, researchers, and publishers in the Mining and Mineral Processing field practical insights into the potential benefits and challenges associated with the changing landscape of indexed journals, as well as in-depth, systematic analyses that provide potential authors with the opportunity to select the most suitable journal for submitting their papers.

Keywords: Mining and Mineral Processing journals; WoS; SCIEx; ESCI; ranking

Citation: Korman, T.; Malvić, T.; Lozynskyi, V.; Briševac, Z.; Kovač, Z.; Hrnčević, L.; Pavlić, K. Mining and Mineral Processing Journals in the WoS and Their Rankings When Merging SCIEx and ESCI Databases—Case Study Based on the JCR 2022 Data. *Publications* **2024**, *12*, 3. https://doi.org/10.3390/publications12010003

Academic Editors: Costantino Thanos and Andrew Kirby

Received: 14 November 2023
Revised: 18 December 2023
Accepted: 17 January 2024
Published: 19 January 2024

1. Introduction

Journal rankings are commonly used to assess publishing houses and writers. They have become an essential tool for research and library administration and can be generated in a variety of ways, ranging from a group agreement among specialists to a journal impact index based on citations [1–3]. The Web of Science (abbr. WoS) maintains several databases including its Core Collection, the Science Citation Index—Expanded, the Social Sciences Citation Index, the Art and Humanities Citation Index, the Emerging Sources Citation Index, the Conference Proceeding Citation Index, and the Book Citation Index. Another derivative base from the Core Collection is the Journal Citation Reports (abbr. JCR) for the journals ranked based on the Journal Impact Factor (abbr. JIF) and divided into quartiles (abbr. Q). Nowadays, the JCR is published once per year, usually in late June, and is considered the most prestigious measure of the international impact of a journal. Until 2022, only a part of the journals selected in the WoS had been selected in the JCR and had calculated the JIF. For example, those were all the journals, considering only the fields of natural and technical sciences, selected in the following databases: Current Contents (abbr. CC), Science Citation Index (abbr. SCI), and Science Citation Index—Expanded (abbr. SCIEx), as the largest single database including the first two (vice versa is not valid).

However, from 2015 onward, the WoS developed a fourth database named the Emerging Sources Citation Index (abbr. ESCI), where Clarivate (the owner of the WoS) included all the journals that applied for WoS inclusion and passed the evaluation process but did not receive final editorial approval for inclusion in the SCIEx. For the ESCI journals, (self) citations, the h-index, and the number of publications per year had been calculated, but

the JIF, and consequently, quartiles were not, so they were omitted from the annual JCR report. This changed in 2022 when the ESCI journals were included in the JCR, but without rankings in the quartiles based on the impact factor [4].

Almost at the same time, Clarivate introduced the Journal Citation Indicator (abbr. JCI) in the WoS, as an additional ranking measure, which has been calculated since 2021 for all the journals in the WoS, regardless of their database, and by which all the journals have been immediately ranked into the quartiles based on the JCI value. So, the JIF is a relatively simple measure, and the JCI is a measure of the average Category Normalized Citation Impact (CNCI) of the citing items (articles and reviews) published by a journal over the last three-year period. Clarivate introduced the JCI to enable evaluation of the journals based on other metrics in addition to the JIF, but also following the Scopus database (by Elsevier) that has two weighted and normalized measures for journal ranking [5], namely, the Scimago Journal Rank (abbr. SJR) and the Source Normalized Impact per Paper (abbr. SNIP). It is important to mention that in December 2016, Scopus launched the Citescore as an alternative to the Clarivate's JIF measure [6,7].

Such normalization of the impact factors and similar measures based on database subject categories is a statistically demanding process [8] and is out of the scope of this paper. Consequently, this study included the publication, ranking, and citation patterns of the journals selected in the JCR subcategory Mining and Mineral Processing. Previously, some of the current authors edited such journals and published a citation analysis [9].

The JCR is a very large database that includes 254 categories in 21 groups, where the number of categories decreases from 59 categories in the Clinical Medicine group to 7 categories in the Agricultural Sciences as well as in the Philosophy and Religion category. The number of journals ranges from 7441 journals in Clinical Medicine to 423 in the Agricultural Sciences [10]. The analyzed data are part of the Engineering group, where 41 categories and 3,556 journals exist in the JCR 2022. The data were derived for the subcategory Mining and Mineral Processing (both belonging to the Engineering and Geosciences) which includes 20 journals that are part of the SCIEx (median Impact Factor (IF) 2.2) and 12 that are part of the ESCI (median IF 1.2).

2. Analysis of the Mining and Mineral Processing Journals' Rankings in the JCR 2022

2.1. Journal Impact Factor

The Journal Impact Factor (JIF) is a scientometric variable calculated by Clarivate as a journal-level metric. From the moment of its introduction, it has been used as the most popular measure for the assessment of a journal's prestige in the academic field (or the WoS subject group) and is often used by universities or funding bodies in decision processes for different applications, for example [11]. However, others asked for some other tools that provide a more fair evaluation, for example, [12], or, as presented in [13],"... a theoretical analysis of statistical arguments against the use of the impact factor at the level of individual articles."

The calculation of the JIF is a simple mathematical expression (Equation (1)), where, for any year, the JIF is the ratio between the number of citations received in a selected year and the total number of publications (or citable items) in that journal in the preceding years [14]:

$$IF_y = \frac{Citations_y}{Publications_{y-1} + Publications_{y-2}}, \quad (1)$$

where y is the selected/observed year, and $y - 1$ and $y - 2$ are the two preceding years regarding the selected one.

So, officially, the JIF is a two-year measure, although it can be calculated for any given number of the preceding years. Consequently, the JCR includes information about a five-year JIF [15].

It is worth mentioning that the JIF is the most used bibliometric variable for the evaluation of a journal's and sometimes also an author's impact. The strength of this value is its statistical simplicity, but here also lays the main disadvantage, i.e., the comparison

of the JIFs in different scientific fields is not possible because of different citation averages and cumulative scores during certain periods, the strong influence of a few highly cited journal's papers [16], statistical non-representativeness [17], or skewed metrics [18].

2.2. Journal Citation Indicator

The Journal Citation Indicator was introduced by Clarivate in 2021 as a new journal metric that can be compared across scientific fields (Clarivate's groups and (sub)categories) and accounts for the specific characteristics of different fields and their publications [19]. Consequently, it is a complex and weighted measure, as opposed to the JIF, which is a simple citation-counting tool.

The new Journal Citation Indicator meets this requirement for journal evaluation, providing a single number that represents the specific characteristics of different fields and their publications [19]. The calculation of the JCI is a simple derivative of another of Clarivate's measures [20]—the Category Normalized Citation Impact (CNCI) (Equations (2)–(4)):

$$CNCI = \frac{c}{e_{ftd}}, \tag{2}$$

$$CNCI = \frac{\sum \frac{c}{e_{f(n)td}}}{n}, \tag{3}$$

$$CNCI_{journal} = \frac{\sum CNCI_{paper}}{p} \tag{4}$$

where e is the expected citation rate or baseline, c is the number of times cited, n is the number of subjects to which a paper is assigned, p is the number of papers, f is the field or subject area, t is the year, d is the document type, and *journal* (or "i" in original) is the entity being evaluated (journal, institution, country/region, person, etc.).

Equation (3) is optionally applied when the document belongs to multiple categories. The CNCI is first calculated for each category and the final value is an average of such values. If a category is filtered, a single CNCI will be given for that category. Generally, the CNCI value of 1 represents something similar to a "world average".

Moreover, the JCI is a journal's value defined as the mean CNCI(s) for all the articles and reviews (as citable documents) in the three preceding years. For example, the 2023 JCI will be calculated from the CNCIs of all the documents published in the period 2019–2022, and it will be interpreted in the same way ("CNCI value of 1.0 means that, across the journal, published papers received a number of citations equal to the average citation count in that subject category") [20].

The JCI was introduced to increase the information obtained using the JIF, mostly trying to "weight" the fact that the number and period of receiving a citation is highly dependent on the subject field. In addition to the equation(s), the next major difference between the JIF and the JCI is the observed period of citing papers, which, in the case of the JIF, is two, and in the case of the JCI, is three years.

2.3. Merging of the Mining and Mineral Processing Journals' Rankings Based on the JIF and JCI Values

In 2022, Clarivate announced that Journal Citation Reports (JCR) would extend the JIF to all journals in the Web of Science Core Collection (WoS CC) [21], including those indexed in AHCI and the multidisciplinary ESCI. In late June 2023, the Journal Citation Report update was released, which included an expansion of JIF coverage to all journals in the (WoS CC), resulting in the inclusion of more than 9000 journals from more than 3000 publishers for the first time. This is, of course, very important for small publishers such as universities and scientific institutes. However, it should be noted that the AHCI and the ESCI journals will not be ranked, i.e., receive a quartile (percentile), until 2024 [22], when they will be selected in Q1–Q4 based on the JIF 2023.

In Table 1, a comparison of the JIF and JCI rankings of journals in the Mining and Mineral Processing subcategory in JCR 2022 is shown. The table shows that five journals from the

ESCI database have a JIF score above the median (1.6–1.9, i.e., values of the 16th and 17th places) for the upgraded category. In addition, one of the ESCI journals with a JIF value of 8.3 is in second place in the imaginary JCR 2022 ranking presented in Tables 1 and 2. Some ESCI journals have higher IFs than SCIE journals but are not included in the SCIE database, probably because they do not fulfill some or all additional citation criteria (citations of authors, editorial board members, and/or content). It is obvious that several ESCI journals have higher IFs than SCIE journals but are currently not included in the SCIE database. This indicates that a more urgent, faster, and transparent procedure for the Clarivate calculations of provisional impact factors and quartiles for the entire ESCI database is required.

Such evaluation [23] was preceded by an evaluation of (first) initial triage (ISSN, journal title, journal publisher, URL (online journals), content access, presence of peer review policy, contact details); (second) editorial triage (scholarly content, article titles, and article abstracts in English), bibliographic information in Roman script, clarity of language, timeliness and/or publication volume, website functionality/journal format, presence of ethics statements, editorial affiliation details, author affiliation details); and (third) editorial evaluation/first part (editorial board composition, validity of statements, peer review, content relevance, grant support details, adherence to community standards, author distribution, appropriate citations in the literature). Initial triage (first), editorial triage (second), and editorial evaluation/first part (3rdA) are commonly known as "Quality Criteria", and their fulfillment is a requirement for inclusion in the ESCI, and the title is evaluated for (further) impact.

Table 1. Comparison of the JIF and JCI rankings of journals in Mining and Mineral Processing in the JCR 2022. The dark purple shade is used for the journals in the SCIEx, and the light purple shade is used for those in the ESCI.

JCR Abbreviation	ISSN	eISSN	2022 JIF	JIF Quartile	JCI	JCI Quartile
INT J MIN SCI TECHNO	2095-2686	2212-6066	11.8	Q1	3.14	Q1
INT J COAL SCI TECHN	2095-8293	2198-7823	8.3	N/A	1.72	Q1
INT J ROCK MECH MIN	1365-1609	1873-4545	7.2	Q1	2.29	Q1
MIN PROC EXT MET REV	0882-7508	1547-7401	5	Q1	0.99	Q1
MINER ENG	0892-6875	0892-6875	4.8	Q1	1.32	Q1
INT J MIN MET MATER	1674-4799	1869-103X	4.8	Q1	0.95	Q1
ORE GEOL REV	0169-1368	1872-7360	3.3	Q2	1.23	Q1
JOM-US	1047-4838	1543-1851	2.6	Q2	0.62	Q2
MINERALS-BASEL	N/A	2075-163X	2.5	Q2	0.75	Q1
INT J MIN RECLAM ENV	1748-0930	1748-0949	2.4	Q2	0.64	Q2
MAR GEORESOUR GEOTEC	1064-119X	1521-0618	2.2	Q2	0.68	Q2
INT J COAL PREP UTIL	1939-2699	1939-2702	2.1	Q3	0.58	Q2
J APPL GEOPHYS	0926-9851	1879-1859	2	Q3	0.59	Q2
J MIN INST	2411-3336	2541-9404	2	N/A	0.61	Q2
MINING METALL EXPLOR	2524-3462	2524-3470	1.9	Q3	0.48	Q3
MIN MINER DEPOSITS	2415-3435	2415-3443	1.9	N/A	0.46	Q3
ACTA MONTAN SLOVACA	1335-1788	N/A	1.6	Q3	0.59	Q2
PHYSICOCHEM PROBL MI	1643-1049	2084-4735	1.5	Q3	0.3	Q4
RUD-GEOL-NAFT ZB	0353-4529	1849-0409	1.3	N/A	0.43	Q3
MIN SCI	2300-9586	2353-5423	1.3	N/A	0.35	Q3
ARCH MIN SCI	0860-7001	1689-0469	1.2	Q4	0.43	Q3
MIN PROC EXT MET-UK	2572-6641	2572-665X	1.2	N/A	0.57	Q2
MIN TECHNOL	2572-6668	2572-6676	1.1	N/A	0.44	Q3
J SUSTAIN MINING	2543-4950	2300-3960	1	N/A	0.14	Q4
J S AFR I MIN METALL	2225-6253	2411-9717	0.9	Q4	0.23	Q4
GOSPOD SUROWCAMI MIN	0860-0953	2299-2324	0.9	Q4	0.34	Q3
ACTA GEODYN GEOMATER	1214-9705	N/A	0.9	Q4	0.3	Q4
J MIN SCI+	1062-7391	1573-8736	0.8	Q4	0.26	Q4
J MIN ENVIRON	2251-8592	2251-8606	0.8	N/A	0.32	Q3
KOMPLEKS ISPOL MINER	2224-5243	2616-6445	0.7	N/A	0.23	Q4
EURASIAN MIN	2072-0823	2414-0120	0.7	N/A	0.21	Q4
INZ MINER	1640-4920	1640-4920	0.3	N/A	0.1	Q4

The later part of the editorial evaluation (3rdB) is known as "Impact Criteria" (comparative citation analysis, author citation analysis, editorial board citation analysis, content significance). A successful outcome results in publication title inclusion in the SCIEx, SSCI, or AHCI databases. The previously mentioned transparent and faster process of the provisional calculation of impact is crucial for the reliability of the later part of the third step in the Web of Science evaluation process, i.e., the editorial evaluation of citation impact that is directly connected to any impact variable (JIF, JCI). Consequently, Clarivate would need to publish time intervals in which such impact is calculated and inform publication editors of the journal performance with citation details necessary for calculation.

Table 2 shows the imaginary JCR 2022 ranking in quartiles with the merging of journals from the ESCI and SCIE databases. The ranking in quartiles is based on the JIF 2022 calculated with three decimal places, although, according to the JCR, the JIF now has only one decimal place instead of three. The JIF with only one decimal place will probably result in more rank position ties in many categories. According to Clarivate, this change encourages the comparison of journals considering additional indicators and descriptive data in [22].

Table 2. The imaginary JCR 2022 ranking into quartiles with merging journals. Quartiles are marked with green (Q1), yellow (Q2), orange (Q3), and red (Q4). Journals in SCIEx are outlined with dark purple and those in ESCI (quartiles not officially calculated) are outlined with light purple.

JCR Abbreviation	2022 JIF	JIF Quartile
INT J MIN SCI TECHNO	11.766	Q1
INT J COAL SCI TECHN	8.299	Q1
INT J ROCK MECH MIN	7.229	Q1
MIN PROC EXT MET REV	5.000	Q1
MINER ENG	4.782	Q1
INT J MIN MET MATER	4.757	Q1
ORE GEOL REV	3.340	Q2
JOM-US	2.608	Q2
MINERALS-BASEL	2.455	Q2
INT J MIN RECLAM ENV	2.402	Q2
MAR GEORESOUR GEOTEC	2.201	Q2
INT J COAL PREP UTIL	2.063	Q2
J APPL GEOPHYS	2.034	Q2
J MIN INST	2.000	Q2
MINING METALL EXPLOR	1.924	Q2
MIN MINER DEPOSITS	1.850	Q2
ACTA MONTAN SLOVACA	1.609	Q3
PHYSICOCHEM PROBL MI	1.517	Q3
RUD-GEOL-NAFT ZB	1.323	Q3
MIN SCI	1.250	Q3
ARCH MIN SCI	1.208	Q3
MIN PROC EXT MET-UK	1.202	Q3
MIN TECHNOL	1.085	Q3
J SUSTAIN MINING	0.979	Q3
J S AFR I MIN METALL	0.947	Q4
GOSPOD SUROWCAMI MIN	0.924	Q4
ACTA GEODYN GEOMATER	0.882	Q4
J MIN SCI+	0.832	Q4
J MIN ENVIRON	0.772	Q4
KOMPLEKS ISPOL MINER	0.690	Q4
EURASIAN MIN	0.679	Q4
INZ MINER	0.317	Q4

However, the quartile-based rankings, a few decades ago, became major scientific criteria in many academic communities around the world and were applied in the ranking of project applicants or results of simply the "successfulness" of institutions. Using the quartiles as criteria for distinguishing "good" from "bad" or "important" from "mediocre"

science, research, scientific, or state organizations gave the "power of judgement" to the (truly) simple statistical tool and expressions, and also to (the not public) crawling algorithms belonging to private consortiums.

However, as one of the consequences, the ranking of journals became the most important achievement for many editors and editorial boards, putting aside even the content quality as the main reason why something is published and why journals or any other periodical exist. So, the merging of the SCIEx and ESCI, i.e., including the second one, with the JCR became the most important thing for many editorial groups, especially those in the ESCI journals, where obtaining the JIF can be the difference between progress and disappearance on the margins of scientific publishing. The data in Table 2 reveal that many of the ESCI titles will probably fit into Q3/Q4 (JCR 2023) and only then start to attract more citable authors and papers on the (long) way toward the upper quartiles.

In addition to the analysis of the journal rankings with the JIF, a comparison of the WoS and Scopus scholarly metric scores was analyzed among journals in the Mining and Mineral Processing subcategory in JCR 2022. In contrast to WoS, Scopus does not have a category that covers only the Mining and Mineral Processing topics. However, of the 32 journals listed under the category Mining and Mineral Processing in WoS, 31 are indexed in Scopus under the subcategory Geotechnical Engineering and Engineering Geology, which is part of the main category Earth and Planetary Sciences. The journal metrics from WoS (the JIF and the JCI) and Scopus (the SJR, the CiteScore, and the SNIP) for the year 2022 are shown in Table 3.

Table 3. Comparison of WoS and Scopus scholarly metric values among journals in the Mining and Mineral Processing category in JCR 2022. Journals in SCIEx are outlined with dark purple and those in ESCI are outlined with light purple.

JCR Abbreviation	JIF	JCI	CiteScore	SJR	SNIP
INT J MIN SCI TECHNO	11.766	3.14	15.293	1.991	2.94
INT J COAL SCI TECHN	8.299	1.72	9.878	1.175	1.915
INT J ROCK MECH MIN	7.229	2.29	12.963	1.965	2.305
MIN PROC EXT MET REV	5	0.99	8.15	0.915	2.238
MINER ENG	4.782	1.32	8.468	1.018	1.577
INT J MIN MET MATER	4.757	0.95	6.827	0.854	1.386
ORE GEOL REV	3.34	1.23	6.21	1.172	1.31
JOM-US	2.608	0.62	4.946	0.569	0.888
MINERALS-BASEL	2.455	0.75	3.942	0.53	1.002
INT J MIN RECLAM ENV	2.402	0.64	5.497	0.479	1.166
MAR GEORESOUR GEOTEC	2.201	0.68	5.185	0.704	1.316
INT J COAL PREP UTIL	2.063	0.58	3.331	0.337	1.12
J APPL GEOPHYS	2.034	0.59	3.655	0.627	1.043
J MIN INST	2	0.61	5.411	0.782	1.309
MINING METALL EXPLOR	1.924	0.48	2.93	0.396	0.798
MIN MINER DEPOSITS	1.85	0.46	3.96	0.473	1.057
ACTA MONTAN SLOVACA	1.609	0.59	2.855	0.342	0.687
PHYSICOCHEM PROBL MI	1.517	0.3	2.235	0.271	0.546
MIN SCI	1.25	0.35	2.313	0.201	0.53
RUD-GEOL-NAFT ZB	1.323	0.43	2.488	0.328	0.708
ARCH MIN SCI	1.202	0.43	2.378	0.319	0.553
MIN PROC EXT MET-UK	1.208	0.57	3.35	0.338	1.065
MIN TECHNOL	1.085	0.44	2.878	0.408	0.748
J SUSTAIN MINING	0.979	0.14	4.933	0.502	0.955
ACTA GEODYN GEOMATER	0.947	0.3	1.971	0.226	0.373
J S AFR I MIN METALL	0.882	0.23	1.484	0.242	0.485
GOSPOD SUROWCAMI MIN	0.924	0.34	1.713	0.215	0.339
J MIN SCI+	0.832	0.26	1.497	0.232	0.673
J MIN ENVIRON	0.772	0.32	1.866	0.169	0.405
EURASIAN MIN	0.69	0.21	2.89	0.65	1.208
KOMPLEKS ISPOL MINER	0.679	0.23	-	-	-
INZ MINER	0.317	0.1	0.693	0.23	0.232

Based on the citation indexes of WoS and Scopus in 2022, Table 4 presents the hypothetical quartile ranking of the journals in the JCR Mining and Mineral Processing subcategory. For each citation index, the distribution of journals by quartiles was made in the range of Q1 to Q4. In Table 4, in addition to the quartile ranking, the relative change in the journal's position according to the different citation indexes is given, indicated with a number in brackets (*n*).

The number (*n*) denotes the relative difference between the journal's rank according to the JCR, CiteScore, SJR, and SNIP and its rank according to the JIF in the Mining and Mineral Processing subcategory. A negative value of the number (*n*) for a particular citation index indicates that the journal is placed *n* places lower than its JIF ranking position. The data are intended to show how citation indexes affect the rank of a journal.

Table 4. The imaginary quartile ranking of journals in the JCR Mining and Mineral Processing category based on the scientific metrics of WOS and Scopus and their relative rank change in the JIF ranking. Quartiles are marked with green (Q1), yellow (Q2), orange (Q3), and red (Q4).

JCR Abbreviation	JIF (Q)	JCI Q (n)	CiteScore Q (n)	SJR Q (n)	SNIP Q (n)
INT J MIN SCI TECHNO	Q1	Q1 (0)	Q1 (0)	Q1 (0)	Q1 (0)
INT J COAL SCI TECHN	Q1	Q1 (−1)	Q1 (−1)	Q1 (−1)	Q1 (−2)
INT J ROCK MECH MIN	Q1	Q1 (1)	Q1 (1)	Q1 (1)	Q1 (1)
MIN PROC EXT MET REV	Q1	Q1 (−2)	Q1 (−1)	Q1 (−2)	Q1 (1)
MINER ENG	Q1	Q1 (1)	Q1 (1)	Q1 (0)	Q1 (0)
INT J MIN MET MATER	Q1	Q1 (−1)	Q1 (0)	Q1 (−1)	Q1 (0)
ORE GEOL REV	Q1	Q1 (2)	Q1 (0)	Q1 (3)	Q1 (−1)
JOM-US	Q1	Q2 (−3)	Q2 (−3)	Q2 (−4)	Q3 (−10)
MINERALS-BASEL	Q2	Q1 (1)	Q2 (−5)	Q2 (−4)	Q2 (−7)
INT J MIN RECLAM ENV	Q2	Q2 (0)	Q1 (2)	Q2 (−5)	Q2 (−1)
MAR GEORESOUR GEOTEC	Q2	Q2 (2)	Q2 (1)	Q2 (2)	Q1 (4)
INT J COAL PREP UTIL	Q2	Q2 (−3)	Q3 (−5)	Q3 (−9)	Q2 (0)
J APPL GEOPHYS	Q2	Q2 (0)	Q2 (−2)	Q2 (2)	Q2 (−2)
J MIN INST	Q2	Q2 (2)	Q2 (5)	Q1 (6)	Q2 (5)
MINING METALL EXPLOR	Q2	Q3 (−2)	Q3 (−3)	Q3 (−3)	Q3 (−4)
MIN MINER DEPOSITS	Q2	Q3 (−2)	Q2 (3)	Q2 (0)	Q2 (2)
ACTA MONTAN SLOVACA	Q3	Q2 (3)	Q3 (−4)	Q3 (−2)	Q3 (−5)
PHYSICOCHEM PROBL MI	Q3	Q4 (−7)	Q4 (−7)	Q3 (−6)	Q4 (−7)
RUD-GEOL-NAFT ZB	Q3	Q3 (−1)	Q3 (−3)	Q3 (−3)	Q3 (−2)
MIN SCI	Q3	Q3 (−2)	Q3 (−4)	Q4 (−10)	Q4 (−6)
MIN PROC EXT MET-UK	Q3	Q2 (5)	Q2 (5)	Q3 (1)	Q2 (8)
ARCH MIN SCI	Q3	Q3 (1)	Q3 (−1)	Q3 (−1)	Q3 (−2)
MIN TECHNOL	Q3	Q3 (4)	Q3 (3)	Q3 (6)	Q3 (3)
J SUSTAIN MINING	Q3	Q4 (−7)	Q2 (12)	Q2 (10)	Q3 (7)
ACTA GEODYN GEOMATER	Q4	Q4 (−1)	Q4 (−1)	Q4 (−3)	Q4 (−4)
GOSPOD SUROWCAMI MIN	Q4	Q3 (3)	Q4 (−2)	Q4 (−3)	Q4 (−4)
J S AFR I MIN METALL	Q4	Q4 (−1)	Q4 (−3)	Q4 (2)	Q4 (0)
J MIN SCI+	Q4	Q4 (1)	Q4 (−1)	Q4 (2)	Q3 (5)
J MIN ENVIRON	Q4	Q3 (5)	Q4 (2)	Q4 (−2)	Q4 (1)
EURASIAN MIN	Q4	Q4 (0)	Q3 (11)	Q2 (20)	Q2 (20)
KOMPLEKS ISPOL MINER	Q4	Q4 (2)	Q4 (−1)	Q4 (−1)	Q4 (−1)
INZ MINER	Q4	Q4 (0)	Q4 (1)	Q4 (5)	Q4 (1)

3. Discussion

The obtained results should be carefully interpreted, considering all the uncertainties that resulted from the presented analysis. The inclusion of the ESCI journals brought an additional 12 items into the primary set of 20 journals, i.e., the database increased by 60%. The addition of all the WoS Core Collection journals to the JCI in 2021 increased its coverage to more than 21,000 scholarly publication titles, adding around 7000 journals from the ESCI (about a 50% increase in the database), especially in some disciplines, bringing deeper

regional or specialty area coverage. Consequently, the extension of the JCR in the Mining and Mineral Processing subcategory is similar to the entire database.

Moreover, in the new ranking, of the first 15 places, 13 were taken by journals belonging to the SCIEx, and the last 29th–32nd places were taken by journals from the ESCI. There is an ongoing discussion about what the ESCI really represents in terms of quality. If Figure 1 is discussed in terms of analyzing the SCIEx vs. the ESCI, then four values are available for interpretation: the mean value (μ), marked with a red line, the standard deviation (σ), and the percentage of journals with a Journal Citation Indicator above 1.0 and 1.5.

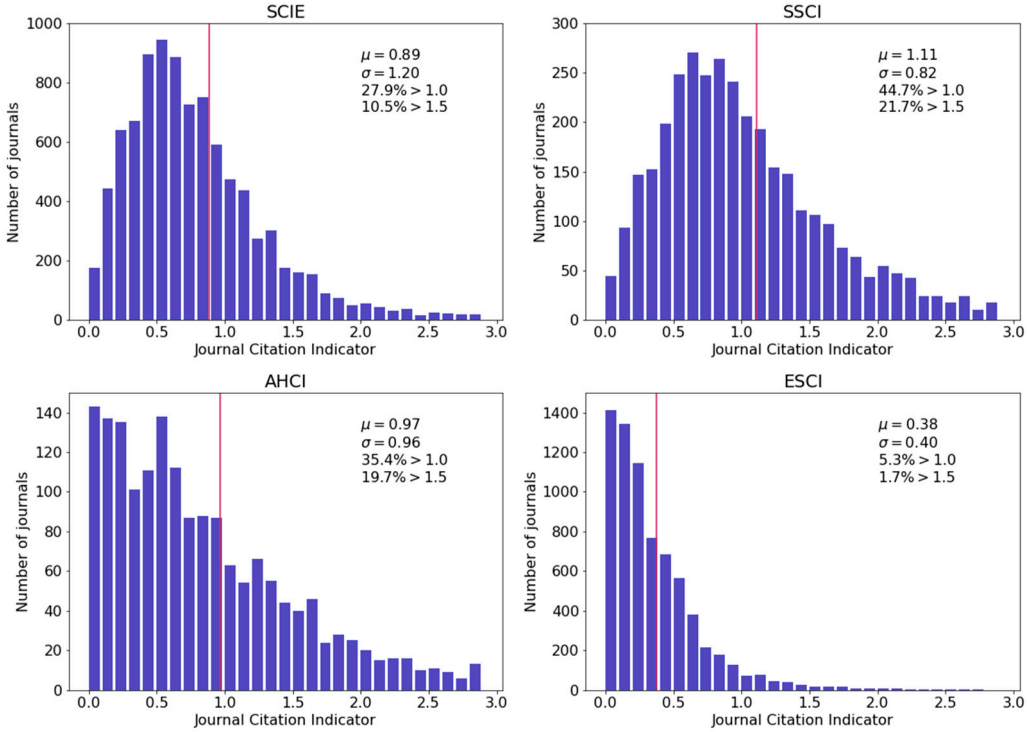

Figure 1. Distribution of the Journal Citation Indicator values in different Web of Science collections [15].

It is evident that all the variables favor journals belonging to the SCIEx with a mean (JCI) of 0.89 (vs. 0.38 in the ESCI). Even wider standard deviations indicate that a higher percentage of the journals will have significantly higher mean values in the SCIEx than in the ESCI, which is demonstrated with 10.5% of the SCIEx journals having a JCI > 1.5 (vs. only 1.7% in the ESCI). Due to lower achievements, i.e., values of the JCI variable, the citation impact of the ESCI is significantly lower, and this is the main reason why ESCI's journals mostly cannot fulfill the last editorial criterion of the Clarivate editorial evaluation during the journal assessment—impact. The sub-criteria of impact are defined to select "the most influential" journals in each scientific field and move them toward the SCIEx. In the last few years, the Clarivate policy was to move a given journal from the ESCI to the SCIEx if it reached Q2 in the provisionally calculated JIF, so Q2 was the measure of impact. This made citation activity the primary indicator of impact [10], with the journals being continuously monitored and re-evaluated when the citations indicate that the (citation) impact can be reached.

The criteria, based on "impact", are designed to select the most influential journals in a given field of research, using citation activity as the primary indicator of impact. If a journal does not pass this step, its performance will be monitored. Journals are periodically re-evaluated when their citation activity indicates that the impact criteria may be met. The introduction of the JIF for all the journals in WoS CC gave rise to the question of the significance of maintaining the two databases, the SCIEx and the ESCI, bearing in mind

that until June 2023, the JIF was exclusively reserved for the SCIEx. Namely, Clarivate currently uses a single set of 28 criteria to evaluate journals, including 24 quality criteria designed for editorial rigor and best practice, and four impact criteria designed to select the most impactful journals in their fields. Journals that meet the quality criteria enter the ESCI, while journals that meet the additional impact criteria enter the SCIE, the SSCI, and the AHCI. This criterion is furthermore divided into (observing) the following sub-criteria [10]:

- Comparative Citation Analysis—counting citations of the journals from the most selective databases (SCIEx, SSCI, and AHCI) in a given field(s), where the number and sources of citations as well as the stability of citation activity are observed;
- Author Citation Analysis—following journals' publication history in the WoS and citation networks, especially in the journal's category;
- Editorial Board Citation Analysis—analyzing board members' publication history in the WoS and citation networks, especially in a journal's category;
- Content Significance—it must be of interest and importance, as intended for WoS readership and subscribers.

The conundrum ("which came first—the chicken or the egg?") remains unanswered. Did ESCI journals collect fewer citations and consequently mostly reach (in 2022) Q3/Q4 because they were not listed in the JCR and did not attract the attention of the authors? Staying non-attractive to the long-active and funds-seeking large research groups, the ESCI journals simply could not compete with most of the SCIEx journals, especially those in Q1/Q2. Eventually, they did not meet the impact criteria of the Clarivate selection committee, and the "circle is closed".

On average, the journals have a higher CiteScore (4.59) than JIF (2.53). The average Scopus-based impact factor is 88.4% higher than the one based on the WoS data. Although other authors have also reported higher CiteScore than JIF values [24], such a significant discrepancy between Scopus and WoS requires a more detailed analysis. It should be noted that only one subcategory of the Engineering category in WoS, which contains 32 journals, was considered. On the other hand, the difference between the average values of the JCI and the SJR is minimal (Table 5).

Table 5. Basic descriptive statistics for the journals in the Mining and Mineral Processing category in JCR 2022.

	JIF	JCI	CiteScore	SJR	SNIP
Average	2.529	0.697	4.587	0.602	1.061
Median	1.730	0.525	3.350	0.473	1.002
Variance	6.375	0.419	11.450	0.216	0.389
Standard deviation	2.525	0.647	3.384	0.464	0.624
Maximum difference CiteScore-JIF			5.733		
Minimum difference CiteScore-JIF			0.375		
Minimum difference SJR-JCI			0.012		

Based on the Pearson correlation coefficient, a significant bias was found in the ranking of journals according to the WoS and Scopus citation indexes. As expected, the highest correlations were found between the citation indexes of the same database: for JIF-JCI, R^2 was 0.967, and for SJR-CiteScore, R^2 was 0.967 (Table 6). Also, Spearman correlation coefficients were calculated for the data rankings because the journal ranking system is based on quartiles and not directly on the JIF. Interestingly, most Spearman coefficients are a few percent lower than the Pearson values, which indicates that the ranking process is not strictly linear and can produce, as a tool, artificial outliers with large differences for some publication titles if observed in different variables.

According to [25], the correlation coefficient between the JCI and the JIF is 0.904 in the case of Science journals and 0.857 in the case of Social Sciences journals. It was also found that in the Engineering category, the Pearson coefficient is between 0.95 and 1, which is

also true for the Mining and Mineral Processing subcategory in Engineering. Moreover, a significant dependence was found between the JIF- and the Scopus-based citation indexes such as CiteScore, SJR, and SNIP.

Table 6. Correlation results. Green indicates values of the Pearson correlation coefficient; orange indicates values of Spearman's rank coefficient.

Year (2022)	JIF	JCI	CiteScore	SJR	SNIP
JIF	1.000	0.956	0.904	0.826	0.831
JCI	0.967	1.000	0.874	0.807	0.821
CiteScore	0.953	0.949	1.000	0.948	0.948
SJR	0.903	0.938	0.961	1.000	0.940
SNIP	0.901	0.885	0.952	0.920	1.000

It is also important to analyze how different citation indexes affect the ranking of journals within quartiles. To investigate this, all journals in the Mining and Mineral Processing subcategory were ranked according to each citation index and divided accordingly into the quartiles shown in Table 4. Regardless of the citation index, almost half of the journals in this category (47%) did not change their quartile rank. For other journals, there was a change in one quartile, while a change in two quartiles was only observed for two journals (JOM-US and EURASIAN MIN) where JIF and some other quartiles (JCI, Citescore, SJR, or SNIP) deviated for two ranks. For JOM-US, Q1/JIF dropped to Q3/SNIP, and for EURASIAN MIN, the situation was the opposite—Q4/JIF grew to Q2/SNIP. There was one case, if the point of view is not fixed to JIF, involving J SUSTAIN MINING where Q4/JCI corresponded to Q2/CiteScore/SJR.

For the first journal, there was also a significant difference in ranking between the JIF and SNIP by 10 places; for the second, the difference between the JIF and SJR/SNIP was 20 places; and for the third, the difference between the JIF and CiteScore was 12 places. A complete explanation would require a specific analysis, but here, we can outline two reasons for such results: (1) for a large enough statistical population and numerous observed variables, it is reasonable to expect the appearance of outliers and (2) the SNIP, JCI, and SJR are pondered values, and the JIF and CiteScore are not, which is a significant methodological difference.

To determine the mutual influence of the index indicators on the ranking of the journals, Spearman's rank coefficient was used. Table 6 shows that the greatest dependence between the index indicators is from the same databases (JCI-IF, CiteScore-SJR). It is interesting to note that there is a significant dependency between the JIF and CiteScore with a Spearman's rank coefficient of 0.90 and between the SJR and the JCI with a somewhat lower coefficient of 0.80. This can be taken as a strong argument in favor of considering both citation databases as equally legitimate for assessing journal impact factors.

Based on the provided analyses, potential areas for future research can be identified. These areas can help to further explore and understand the impact of different citation indexes on journal rankings and provide valuable insights for researchers, publishers, and the academic community. Future research could investigate the reliability and validity of different citation indexes. This could involve assessing the accuracy of the rankings and their correlation with journal quality, as perceived by experts in the respective fields. Such research could help answer the question of which indexes are more reliable indicators of a journal's impact. So, future research in this area can contribute to a deeper understanding of how citation indexes affect journal rankings and their broader implications for academia. Such directions can help guide academic institutions, researchers, and publishers in making informed decisions and promote transparency and fairness in the evaluation of scholarly work.

However, it must be stressed that authors also select journals using other criteria. The impact factor could be one of the most important because funding and employing institutions use it the most often as a measure of quality. However, for many researchers,

the publication of results as soon as possible is the main goal, and often, they are willing to choose journals in "lower" quartiles without publication fees for fully open access and/or with a fast and transparent publication process, including reviewing, that is publicly displayed in journal instructions for authors. There are many variables that influence the selection of a journal, and only some of them (under citation analysis) are described in this work; however, the others cannot be neglected in future analyses of scholarly publishing.

4. Conclusions

Based on the completed analyses, the conclusions were formulated into the following points:

- The inclusion of ESCI journals in the JCR, merging with SCIEx journals, is a consequence of growing quality. It could be expected that this inclusion will often attract more quality and productive authors and manuscripts and, consequently, further increase the citation and ranking of a journal. However, in the future, all journals need to be re-evaluated using both citation indicators—the JIF and the JCI.
- Most of the newly added journals fit into Q3/Q4. Their JCI values were significantly lower before the inclusion, and the same can be assumed to be valid for the provisional JIF calculated for most of these journals in the past.
- It is evident (from Table 2) that only 3 of 12 journals would be listed in the JCR 2022 in Q1/Q2. A similar outcome can probably be expected in the JCR 2023.
- Based on the Pearson and Spearman rank correlation coefficients, a significant bias was found in the ranking of journals according to the WoS and Scopus citation indexes. Bias is a result of different equations and/or databases used for the calculation of each of the presented variables (JIF, JCI, Citescore, SJR, and SNIP). However, bias is also a consequence of the public's lack of knowledge on exactly how the crawling algorithms both from Clarivate and Elsevier work (periodicity, sources, handling partially wrong given sources, i.e., journal titles, etc.).
- Under the subcategory Mining and Mineral Processing, 32 journals are listed in WoS, of which 31 are indexed in Scopus under the subcategory Geotechnical Engineering and Engineering Geology. Looking at the ranking of the journals in the Mining and Mineral Processing subcategory according to the Scopus index indicators, it can be seen that almost half of the journals (47%) have not changed their quartile rank. For other journals, there was a change in one quartile, while a change in two quartiles was only observed for two journals.
- Looking at the data of the WoS and the Scopus citation indexes, it is reasonable to conclude that both databases are equally relevant in the evaluation and ranking of journals, even though the rankings of a few journals changed significantly.
- In the future, all journals need to be re-evaluated using both citation indicators—the JIF and the JCI.

Author Contributions: Conceptualization, T.K. and T.M.; methodology, T.K., T.M., V.L., Z.B., Z.K., L.H. and K.P.; validation, T.K. and V.L.; writing, T.K., T.M., V.L., Z.B., Z.K., L.H. and K.P.; visualization, T.K.; supervision, T.K. and T.M. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Data Availability Statement: Data are contained within the article.

Acknowledgments: The authors thank the anonymous reviewers and editors for their generous and constructive comments that have improved this paper. This work was supported by the Institutional project (311980040), co-funded by the Faculty of Mining, Geology, and Petroleum Engineering.

Conflicts of Interest: The authors declare no conflict of interest.

References

1. Ferrer-Sapena, A.; Díaz-Novillo, S.; Sánchez-Pérez, E.A. Measuring Time-Dynamics and Time-Stability of Journal Rankings in Mathematics and Physics by Means of Fractional p-Variations. *Publications* **2017**, *5*, 21. [CrossRef]
2. Kulczycki, E. Assessing Publications through a Bibliometric Indicator: The Case of Comprehensive Evaluation of Scientific Units in Poland. *Res. Eval.* **2017**, *26*, 41–52. [CrossRef]
3. Kulczycki, E.; Rozkosz, E.A. Does an Expert-Based Evaluation Allow Us to Go beyond the Impact Factor? Experiences from Building a Ranking of National Journals in Poland. *Scientometrics* **2017**, *111*, 417–442. [CrossRef] [PubMed]
4. Archambault, É.; Larivière, V. History of the Journal Impact Factor: Contingencies and Consequences. *Scientometrics* **2009**, *79*, 635–649. [CrossRef]
5. Colledge, L.; de Moya-Anegón, F.; Guerrero-Bote, V.P.; López-Illescas, C.; Moed, H.F. SJR and SNIP: Two New Journal Metrics in Elsevier's Scopus. *Insights* **2010**, *23*, 215. [CrossRef] [PubMed]
6. James, C.; Colledge, L.; Meester, W.; Azoulay, N.; Plume, A. CiteScore Metrics: Creating Journal Metrics from the Scopus Citation Index. *Learn. Publ.* **2019**, *32*, 367–374. [CrossRef]
7. Fernandez-Llimos, F. Differences and Similarities between Journal Impact Factor and Citescore. *Pharm. Pract.* **2018**, *16*, 1282. [CrossRef] [PubMed]
8. Dorta-González, P.; Dorta-González, M.I. Comparing Journals from Different Fields of Science and Social Science through a JCR Subject Categories Normalized Impact Factor. *Scientometrics* **2013**, *95*, 645–672. [CrossRef]
9. Malvić, T.; Andreić, Ž.; Barudžija, U.; Bedeković, G.; Hrnčević, L.; Ivšinović, J.; Korman, T.; Kovač, Z.; Pavlić, K.; Pašić, B. Citation Rate Challenges for a Small Journal Indexed in Scopus and WoS—Case Study from Central Europe (Croatia), Editorial View. *Publications* **2022**, *10*, 32. [CrossRef]
10. Clarivate Analytics 2022 Journal Impact Factor, Journal Citation Reports. Available online: https://jcr.clarivate.com/jcr/home (accessed on 26 October 2023).
11. McKiernan, E.C.; Schimanski, L.A.; Muñoz Nieves, C.; Matthias, L.; Niles, M.T.; Alperin, J.P. Use of the Journal Impact Factor in academic review, promotion, and tenure evaluations. *Elife* **2019**, *8*, e47338. [CrossRef] [PubMed]
12. Curry, S. Let's Move beyond the Rhetoric: It's Time to Change How We Judge Research. *Nature* **2018**, *554*, 147–148. [CrossRef] [PubMed]
13. Ludo, W.; Traag, V.A. Use of the Journal Impact Factor for Assessing Individual Articles: Statistically Flawed or Not? *F1000Research* **2021**, *9*, 366.
14. Clarivate Analytics The Clarivate Impact Factor. Available online: https://clarivate.com/webofsciencegroup/essays/impact-factor/ (accessed on 26 October 2023).
15. APA ISI 5-Year Impact Factor. Available online: https://www.apa.org/pubs/journals/5-year-impact-factor (accessed on 26 October 2023).
16. Ciriminna, R.; Pagliaro, M. The Role of the Journal Impact Factor in Chemistry Research. *CHIMIA* **2023**, *77*, 62–65. [CrossRef] [PubMed]
17. Curry, S. Sick of Impact Factors. 13 August 2012. Available online: http://occamstypewriter.org/scurry/2012/08/13/sick-of-impact-factors/ (accessed on 18 December 2023).
18. Seglen, P.O. The skewness of science. *J. Am. Soc. Inf. Sci.* **1992**, *43*, 628. [CrossRef]
19. Szomszor, M. Introducing the Journal Citation Indicator: A New, Field-Normalized Measurement of Journal Citation Impact. Clarivate. Available online: https://clarivate.com/blog/introducing-the-journal-citation-indicator-a-new-field-normalized-measurement-of-journal-citation-impact/2021 (accessed on 13 November 2023).
20. Clarivate, inCities Help. Indicators Handbook, Indicators and Calculations, Normalized Indicators. Available online: https://incites.help.clarivate.com/Content/Indicators-Handbook/ih-normalized-indicators.htm?Highlight=Category%20Normalized%20Citation%20Impact%20 (accessed on 26 October 2023).
21. Clarivate Web of Science Journal Evaluation Process and Selection Criteria. Journal Selection. Available online: https://clarivate.com/products/scientific-and-academic-research/research-discovery-and-workflow-solutions/webofscience-platform/web-of-science-core-collection/editorial-selection-process/editorial-selection-process/ (accessed on 26 October 2023).
22. Heaney Kate Unveiling the Journal Citation Reports 2023: Supporting Research Integrity with Trusted Tools and Data. Available online: https://clarivate.com/blog/unveiling-the-journal-citation-reports-2023-supporting-research-integrity-with-trusted-tools-and-data/ (accessed on 26 October 2023).
23. Clarivate Web of Science Journal Valuation Process (Graphic). Available online: https://clarivate.com/wp-content/uploads/2022/03/WoS-selection-process-Graphic_Journals_web-1.jpg (accessed on 7 January 2024).
24. Okagbue, H.I.; Teixeira da Silva, J.A. Correlation between the CiteScore and Journal Impact Factor of Top-Ranked Library and Information Science Journals. *Scientometrics* **2020**, *124*, 797–801. [CrossRef]
25. Torres-Salinas, D.; Valderrama-Baca, P.; Arroyo-Machado, W. Is There a Need for a New Journal Metric? Correlations between JCR Impact Factor Metrics and the Journal Citation Indicator—JCI. *J. Informetr.* **2022**, *16*, 101315. [CrossRef]