

Coverage analysis of Scopus: A metric approach

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Our aim is to compare the coverage of the Scopus database with that of Ulrich, to determine just how homogenous it is in the academic world. The variables taken into account were subject distribution, geographical distribution, distribution by publishers and the language of publication. The analysis of the coverage of a product of this nature should be done in relation to an accepted model, the optimal choice being Ulrich's Directory, considered the international point of reference for the most comprehensive information on journals published throughout the world. The results described here allow us to draw a profile of Scopus in terms of its coverage by areas – geographic and thematic – and the significance of peer-review in its publications. Both these aspects are highly pragmatic considerations for information retrieval, the evaluation of research, and the design of policies for the use of scientific databases in scientific promotion.

Introduction

To date the Thomson Scientific citation databases have stood out from the rest on two grounds: their multidisciplinary and their international coverage. Comprising approximately 8,700 scientific journals in their Web of Science version, they have become the main tool for information retrieval and for science evaluation studies worldwide. Secondly, particular characteristics concerning information related to

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research quality and its impact in the scientific community have led the governments of some countries to show specific interest in this tool as a means of evaluation, requiring researchers to have published in journals included in these databases – especially in those of a high impact factor – and covered by the Journal Citation Report (JCR).

Yet recently (November 2004) an alternative tool has appeared on the information market: Scopus, created by Elsevier. It is now the largest database for multidisciplinary scientific literature existing on the market. This navigation tool is updated daily and includes summaries and references cited since 1966, from more than 14,000 journals (16,000 if non-active journals are included) and from all areas of knowledge. Scopus offers a complete package of services aside from its bibliographic contents. Its interface, for instance, was designed to provide a global view of results, enabling researchers to quickly identify both what is relevant to them in particular along with the current overall trends in their fields of study. In searching for citations and references, Scopus allows connections by disciplines; it achieves high levels of precision when matching references to summaries; it offers links to the full text, to Open Access sources and library catalogues, to exclusively electronic publications and to cited articles from the results, summary and references lists; and researchers can apply for new contents, sources or document types, even modifying the configurations and personalising their choices. The literature already includes research studies that analyse the characteristics of this product (JACSO, 2004; CODINA, 2005; LAGUARDIA, 2005).

Meanwhile, comparative studies are appearing on the horizon as well, looking at the coverage, interface accessibility, usability, price, etc., of Scopus versus ISI (DEIS & GOODMAN, 2004; JACSO, 2004; LAGUARDIA, 2005). It would appear that Scopus and ISI-WOS have entered head-on competition (PICKERING, 2004) and any comparison of the two products calls for utmost care as well as methodological consistency. Previous authors have compared Ulrich with ISI databases: BRAUN et al. (2000) with SCI, and ARCHAMBAULT et al. (2005) with SSCI and A&H. Ulrich's Directory is clearly a worldwide point of reference for the most comprehensive information on journals published the world over.

However, the aim of this study is not to make a comparison of the two databases (ISI and Scopus), but rather apply similar methodology to look closer at Scopus, examining just how balanced the coverage that it offers is, with the Ulrich directory as the "gold standard" of reference. Scopus's coverage with respect to Ulrich is evaluated by taking a series of variables into account such as journal subject distribution, geographical distribution, distribution by publishers, the language of publication, and whether peer-reviewed or not.

Material and methodology

The two journal collections under comparison are Scopus and the Core version of Ulrich's Directory. At present UlrichsWeb.com is the directory covering the greatest number of journal publications, with over 230,000 titles from approximately 138,000 publishers.

The Serials Analysis System facilitates comparisons between subject categories, publishers, and the language and country of publication, all done working from a base collection of journals both in Ulrich's Universe, which includes all titles (234,173 as of October 2005) and in Ulrich's Core, which contains journals of an academic nature and peer-reviewed (60,859 titles in October 2005). Using the bibliographic information from each journal, the following aspects can be determined: which journals are peer-reviewed, their availability in databases, subscription characteristics, inclusion in the JCR lists, etc. We target two of these areas: the Scopus collection will be analysed and compared with Ulrich's Core in relation to the number of subject areas covered, number of journals in each area (geographic and thematic), and type of review process (peer-reviewed or not).

A key comparison of ISI databases with those of Ulrich's Directory was published in the *Homage to Garfield* in 2000. Our study differs both in point of reference and in subject matter. Whereas the previous authors considered only Science and Technology according to Ulrich CD (BRAUN et al., 2000), our analysis uses the online version of Ulrich's Core (www.ulrichsweb.com) to include all subject categories from the academic world, not just the basic and experimental sciences of Ulrich's Science & Technology (U-S&T). Also, he applied two other conditions concerning journal selection: titles which do not have an ISSN code, and those containing a book, abstract, monograph, etc., in the title were not excluded. In this study matching is done with all the ISSN's of both collections.

Assuming that Ulrich's Periodicals Directory represents the worldwide journal collection, our aim is to determine to what extent it resembles the Scopus collection. Two similarity measures are used to establish correlations between the distributions of journals for the two separate collections. On the one hand, the determination coefficient (R squared value) is calculated using the tendency lines of the distribution graphs, which indicate the degree to which estimated and real values correspond. Then, in order to corroborate this similarity, the Pearson correlation coefficient is applied, as previous authors have done (BRAUN et al., 2000).

Results

Scopus has a total of 16,658 titles in June 2005, of which just 13,832 initially correspond to the ISSN's in Ulrich's Directory. This mismatch is explained by the data shown in Table 1.

Table 1. Scopus collection characteristics

ISSN Scopus	Titles	%
Matching Ulrich's Universe	12996	78.02
Matching Ulrich's Core	11529	69.21
Title History ISSN	433	2.6
Incomplete Serial Record	1	0.01
Invalid ISSN	1	0.01
ISSN Non-Match	214	1.28
Not active	1	0.01
Mergers and Acquisitions	37	0.22
Ceased	146	0.88
Suspended	9	0.05
ISSN SCOPUS in ULRICHSWEB	13838	83.07
Not ISSN/ISBN	1386	8.32
ISBN	1232	7.4
Repetition	202	1.21
Total Scopus	16658	100

Table 2 shows a general comparison of the main areas recorded in the Universe Version of Ulrich's Web; it includes all titles, as does the Core version (though the latter includes only peer-reviewed titles).

Table 2. Scopus vs. Ulrich's Universe / Ulrich's Core comparison

Ulrich's Web		SCOPUS	ULRICH	Percentage	Ulrich's Universe titles library does not hold
Titles	Universe	12,996	234,173	5.55%	221,177
	Core	11,529	60,859	18.94%	49,330
ISSN ULRICH (List Matches)	Universe	12,996	197,076	6.59%	184,080
	Core	11,529	56,527	20.40%	44,998
Refereed	Universe	9,615	29,572	32.51%	19,957
	Core	9,615	29,572	32.51%	19,957
Abstracted/Indexed	Universe	12,597	73,708	17.09%	61,111
	Core	11,273	41,049	27.48%	29,756
Electronic Journal	Universe	10,189	56,215	18.13%	46,026
	Core	9,535	29,309	32.53%	19,774
Magazines for Libraries	Universe	2,712	11,646	23.29%	8,934
	Core	2,601	7,458	34.88%	4,857

Scopus matches 5.55% of the journal titles in relation to Ulrich's Universe version. These represent, in turn, 6.59% of titles that match and of those being analysed; 32.51% of these are peer-reviewed, 17.09% are indexed in databases, and 18.13% are electronic journals.

In relation to the Core version, Scopus represents 18.94% of the Ulrich collection and comparisons are carried out starting from 20.40% of the matching journals. Out of this percentage, 32.51% are peer-reviewed, 27.48% are available on data bases, 32.53% are electronic journals. Altogether, 62.22% are listed in the JCR. These are the values that will be used to establish the threshold; the variables studied will be evaluated as above or below this average value, that is, over or under-represented.

Subject distribution

As a result of the matching process with the Scopus collection, subject distribution in Ulrich's Core was seen to divide knowledge into 151 categories, while Scopus has titles in 120 of them. This means that its subject coverage compared to the worldwide point of reference is 79.47%, taking into account the 2,820 titles made reference to above (Table 1). Figure 1 shows the subject distribution of the two journal collections from a dual perspective.

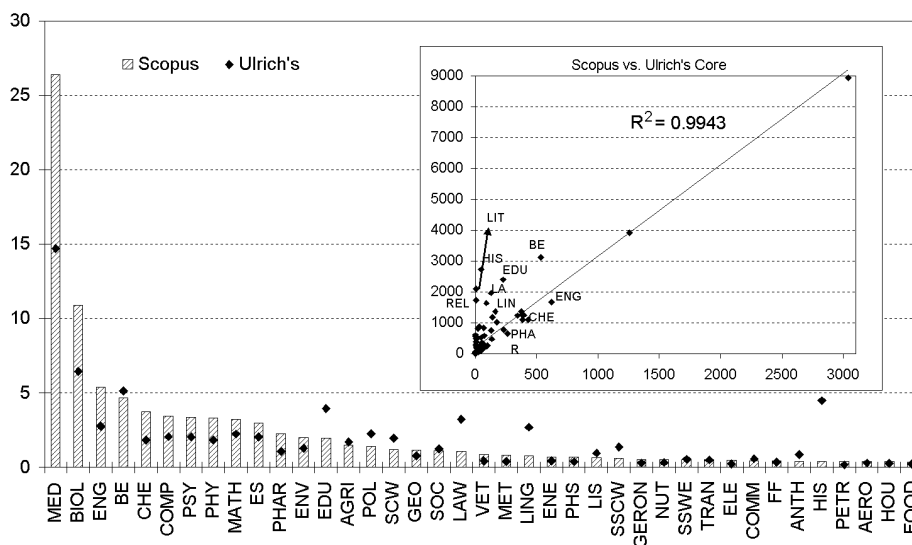


Figure 1. Journal distribution by subject areas – Ulrich's Core

To the left, the percentual distribution is shown, with only the categories that contain at least 10 journals (representing 98.43% of the collection) included. The columns show the number of titles in each category in Scopus in descending order, while the points show the Ulrich Core corresponding values. To the right, the overall distribution between the two collections is shown taking all the categories into account (including those with less than 10 journals) and indicating which are furthest away from the average (above or below the line of regression). The squared R value reflects the similarity of the distribution on the whole.

In Ulrich's Core, 47.5% of all the categories also represented in Scopus pertain to Medicine, Basic Sciences and Technology. These account for 77.46% of the total journals. In turn, 34.17% of the categories belong to Social Sciences, with 19.39% of the collection's journals, and the rest are from Humanities. As can be seen, the categories showing disparity are mainly in Social Sciences and Humanities. This is shown in Jacso's work (Figure 2) and in the information provided by Scopus on its website.

In Table 3 (and the following), categories with at least ten titles are shown, with 5 columns of the percentage distribution in relation to Ulrich's Core. They provide information on the Scopus collection (% S/SC); the Ulrich collection (% U/UC); the percentage of Scopus titles in relation to Ulrich in descending order (%S/UC); and the Scopus refereed journals in relation to Ulrich (Ref/UC).

To assess the balance of international coverage, and bearing in mind that the percentage of Scopus journals in relation to Ulrich Core is 20.40%, this value can be adopted as the threshold point of average representation (hence, categories with higher values are the best represented). As seen in Table 3, 52% are over-represented in terms of coverage and 62% are above the threshold of the peer-reviewed variable. For the total categories with journals, 44% are over-represented. Most of these are from the sciences (81.13%), and 54% have a higher percentage than the average for refereed journals (32.51%) of the whole collection. The determination coefficient in this case is 0.68 and the Pearson coefficient is 0.81.

In order to find the degree of similarity, we applied the Pearson correlation coefficient and obtained a value of 0.9. This reflects the fact that in various categories there are many more journals than in Scopus, as illustrated in Figure 1. By isolating these cases, we see they are mostly from the Humanities and the Social Sciences (probably non-academic). In terms of the determination coefficient, Figure 1 is very illustrative: we can say that Scopus generally has quite a homogenous global representation in all areas except Arts and Humanities. This has been pointed out in previous studies (DEIS & GOODMAN, 2004) and can be seen on Scopus's own website, where it describes its subject coverage.

Table 3. Subject ranking according to the percentage of Scopus journals in Ulrich's Core

Abr.	Ulrich's subject	%Scopus	% Ulrich	%S/U	% Ref S/U
PLAS	Plastics	0.23	0.09	45.61	52.78
PETR	Petroleum and gas	0.40	0.17	43.81	55.56
TIF	Textile industries and fabrics	0.21	0.09	42.11	53.85
PHAR	Pharmacy and pharmacology	2.26	1.07	40.09	50.00
MET	Metallurgy	0.82	0.40	39.17	48.84
CHE	Chemistry	3.74	1.83	38.86	48.20
ELE	Electronics	0.49	0.24	38.10	44.44
ENG	Engineering	5.40	2.77	37.06	50.41
DAA	Drug abuse and alcoholism	0.32	0.16	37.00	50.75
VET	Veterinary science	0.84	0.44	36.47	49.73
PHY	Physics	3.33	1.83	34.56	45.62
PHS	Public health and safety	0.69	0.38	34.20	45.83
MED	Medical sciences	26.37	14.70	34.08	44.77
GERON	Gerontology and geriatrics	0.53	0.30	33.70	48.25
BIOL	Biology	10.90	6.45	32.11	42.92
COMP	Computers	3.44	2.07	31.66	40.40
INS	Instruments	0.10	0.06	31.43	47.62
PSY	Psychology	3.35	2.04	31.18	43.47
PAL	Paleontology	0.31	0.19	31.03	51.56
STA	Statistics	0.34	0.21	30.95	50.68
NUT	Nutrition and dietetics	0.53	0.33	30.20	40.74
ENE	Energy	0.69	0.44	29.70	46.46
ENV	Environmental studies	2.02	1.29	29.64	44.47
WR	Water resources	0.29	0.19	29.31	49.15
FOOD	Food and food industries	0.36	0.24	29.17	44.19
MMI	Mines and mining industry	0.29	0.20	28.57	40.00
ES	Earth sciences	2.99	2.04	27.89	41.55
GEO	Geography	1.15	0.79	27.82	42.13
MATH	Mathematics	3.24	2.25	27.40	37.02
CGP	Ceramics, glass and pottery	0.14	0.10	26.23	48.28
HOU	Housing and urban planning	0.37	0.27	26.06	43.68
AM	Alternative medicine	0.20	0.15	25.84	26.92
OHS	Occupational health and safety	0.22	0.16	25.00	40.74
AERO	Aeronautics and space flight	0.38	0.30	23.91	39.19
METE	Meteorology	0.29	0.24	23.61	39.47
FF	Forests and forestry	0.43	0.37	22.32	41.00
FF	Fish and fisheries	0.24	0.21	21.54	37.50
TRAN	Transportation	0.50	0.50	19.21	36.07
HAN	Handicapped	0.14	0.14	19.05	32.50
HFA	Health facilities and administration	0.17	0.17	18.87	34.00
CRIM	Criminology and law enforcement	0.33	0.34	18.63	33.71
BUI	Building and construction	0.17	0.18	18.35	40.91
SSWE	Social services and welfare	0.52	0.54	18.24	29.41
BE	Business and economics	4.65	5.13	17.20	28.36
PS	Population studies	0.22	0.24	17.01	36.84
ASTRO	Astronomy	0.29	0.33	16.92	36.56
AGRI	Agriculture	1.50	1.70	16.80	32.83
SOC	Sociology	1.11	1.26	16.80	30.63

Table 3. (cont.)

Abr.	Ulrich's subject	%Scopus	% Ulrich	%S/U	% Ref S/U
TCW	Technology: comprehensive works	0.28	0.35	15.09	23.60
CYABOUT	Children and youth_about	0.19	0.27	13.33	26.56
LIS	Library and information sciences	0.64	0.96	12.67	24.81
PFH	Physical fitness and hygiene	0.12	0.19	12.39	25.64
GH	Gardening and horticulture	0.11	0.18	12.04	28.89
POL	Political science	1.41	2.26	11.85	25.96
SCW	Sciences: comprehensive works	1.19	1.96	11.51	22.96
CONS	Conservation	0.16	0.28	11.24	32.73
WS	Women's studies	0.13	0.26	9.49	17.28
EDU	Education	1.95	3.95	9.38	18.96
PA	Public administration	0.16	0.34	9.22	17.89
ANTH	Anthropology	0.42	0.86	9.18	18.75
SSCW	Social sciences: comprehensive works	0.61	1.38	8.36	18.48
LAW	Law	1.09	3.24	6.41	17.12
MIL	Military	0.10	0.29	6.18	6.90
LING	Linguistics	0.78	2.70	5.48	12.70
TT	Travel and tourism	0.09	0.33	5.03	28.13
ARTT	Architecture	0.09	0.36	4.59	11.59
EI	Ethnic interests	0.10	0.44	4.07	8.51
PHIL	Philosophy	0.26	1.46	3.39	6.67
ARCH	Archaeology	0.17	1.33	2.48	8.11
HIS	History	0.40	4.48	1.69	4.61

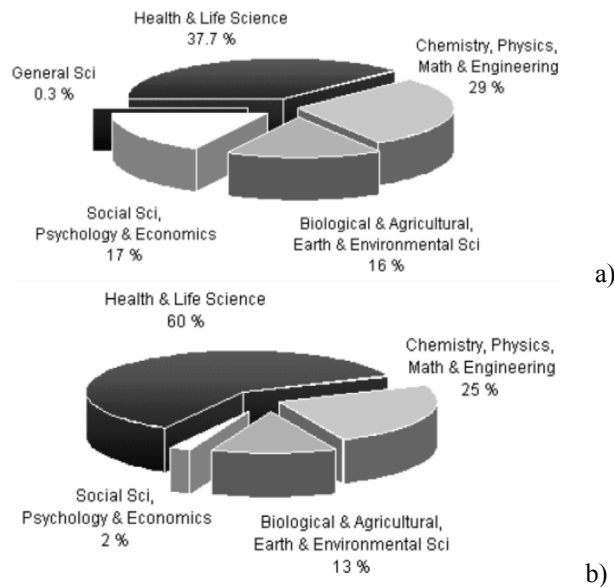


Figure 2. Distribution of journals (a) and records (b) by subject areas in Scopus
 Source: JACSO, *Current Science*, 89 (9) (2004) 1537–1547

Distribution by country of publication

According to Ulrich's Website data, Scopus has journals from 97 different countries. Figure 3 shows distribution by country of publication and dispersal for the two collections. Those with more than 10 titles are shown, standing as approximately 99% of the total. A general parallel trend can be drawn regarding distribution ($r^2 = 0.95$); and Pearson's correlation coefficient for both collections is 0.98. Proportionately, then, Scopus's geographical coverage is similar to Ulrich's except in the United Kingdom, Netherlands and Germany.

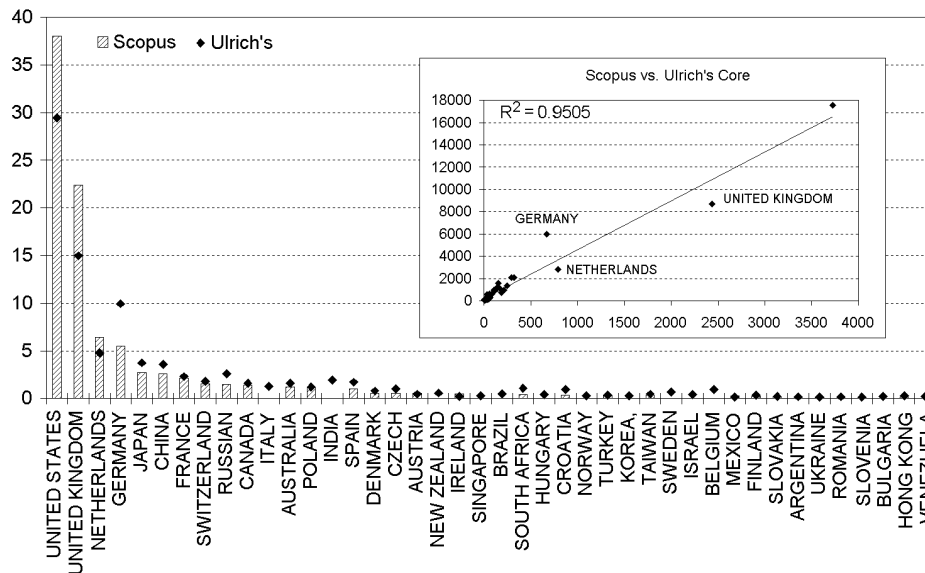


Figure 3. Journal distribution by countries (Ulrich's Core)

Table 4 shows the data for each country with at least ten journals. Taking into account that the percentage of Scopus in relation to Core is 20.40%, then the countries above the average (12%) and harbouring 70% of the titles are the U.S, United Kingdom, Netherlands and Russia among others. The Netherlands is over-represented in the sense that its small geographical size houses a major publishing industry. Here, the significant role of Elsevier is evident. The case in United Kingdom stands out with the greatest number of journals. Approximately 33% of countries are above the number of peer-reviewed titles in the collection.

Table 4. Geographic ranking according to the percentage of Scopus journals in Ulrich's Core

Country	%Scopus	% Ulrich	%S/U	% Ref S/U
United States	33.58	29.45	21.61	32.98
United Kingdom	23.82	14.94	30.20	39.39
Netherlands	7.53	4.73	30.15	38.23
Germany	6.58	9.91	12.58	33.84
Japan	2.80	3.57	14.86	30.21
China	2.71	3.73	13.81	30.68
France	2.18	2.28	18.08	40.44
Switzerland	1.67	1.59	19.79	35.85
Russian Federation	1.43	1.26	21.57	39.06
Canada	1.54	1.77	16.48	27.34
Australia	1.34	2.10	12.15	12.66
Italy	1.32	2.59	9.63	27.25
India	1.17	1.58	14.02	22.86
Poland	1.17	1.89	11.71	23.91
Spain	0.98	1.69	10.96	24.29
Denmark	0.78	1.09	13.62	30.40
Czech Republic	0.56	0.44	24.07	44.53
Austria	0.54	1.01	10.10	27.51
Singapore	0.49	0.57	16.28	40.77
Brazil	0.47	0.79	11.30	16.47
New Zealand	0.47	0.43	20.77	30.52
Ireland	0.43	0.31	26.32	53.93
Croatia	0.41	0.23	34.31	47.14
Hungary	0.39	0.44	16.73	27.17
Turkey	0.37	0.30	23.50	29.66
Korea, Republic of	0.36	0.29	23.86	45.76
South Africa	0.36	0.64	10.49	18.32
Taiwan	0.34	0.29	22.29	29.82
Norway	0.31	0.45	13.24	28.28
Sweden	0.31	0.97	6.11	17.39
Finland	0.28	0.49	10.81	28.41
Israel	0.28	0.35	14.81	29.07
Mexico	0.27	0.42	12.16	22.55
Belgium	0.26	0.95	5.21	7.95
Slovakia	0.23	0.17	24.53	40.00
Hong Kong	0.14	0.14	19.28	16.67
Venezuela	0.14	0.19	13.91	17.28
Argentina	0.13	0.31	7.98	17.86
Ukraine	0.13	0.22	11.11	15.79
Romania	0.13	0.28	8.72	14.55

Language of publication

Roughly 85% of Scopus journals are written in English, underlining that the coverage of scientific output differs tremendously from general information journals. Similarity between the two collections is 0.96. Figure 4 shows the percentage distribution, and the tendency line is traced on the subgraph not taking English into

account. The determination coefficient is 0.9, or 0.99 when taking the collection of journals in English into account.

Apart from English, Ulrich's coverage shows Slovak, Croatian and Czech to be over-represented and lie above the average for refereed journals (Table 5).

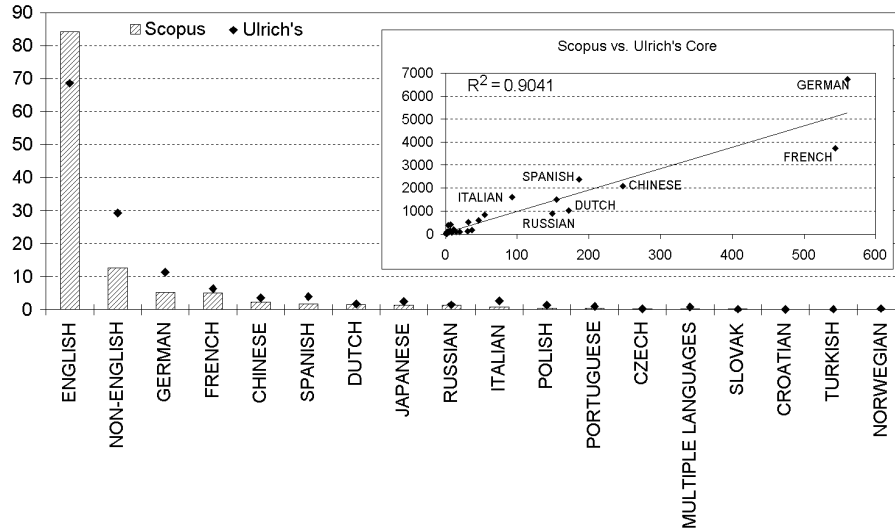


Figure 4. Distribution of journals by language of publication (Ulrich's Core)

Table 5. Linguistic ranking according to the percentage of Scopus journals in Ulrich's Core

Language	%Scopus	% Ulrich	%S/U	% Ref S/U
Croatian	0.23	0.15	30.23	36.59
Slovak	0.27	0.20	27.68	45.45
English	84.74	73.77	22.36	34.58
Czech	0.32	0.31	21.14	40.00
Turkish	0.16	0.17	18.37	21.15
Dutch	1.59	1.81	17.91	26.93
French	4.96	6.75	15.00	27.81
Russian	1.04	1.58	13.47	24.31
Korean	0.10	0.16	12.35	23.53
Chinese	2.28	4.03	11.55	22.84
Japanese	1.28	2.72	9.56	19.50
German	5.34	12.02	9.07	26.16
Portuguese	0.43	1.08	8.21	11.63
Spanish	1.73	4.48	7.91	15.33
Non-english	12.25	31.76	7.87	19.34
Multiple languages	0.32	0.97	6.75	18.03
Polish	0.44	1.52	5.92	13.59
Italian	0.79	2.85	5.66	13.11
Norwegian	0.10	0.37	5.29	8.16

Distribution by publishers

In this section standardised information from the Top Publishers is used, supplied by Ulrich's Directory. Figure 5 shows the distribution of the two journal collections by top publishers. Pearson's correlation coefficient is 0.98 and the squared R is 0.96.

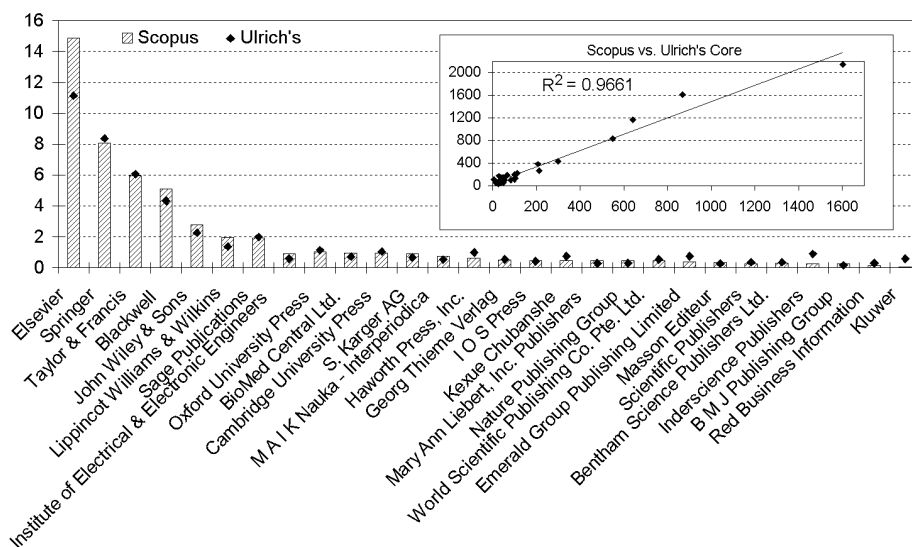


Figure 5. Journal distribution by publishers

Table 6 clearly illustrates how the vast majority of publishers (97%) are over-represented in both versions (Ulrich's Core and Scopus). These figures differ from the distributions by subject areas, countries and language of publication in that there is a small group above the average as opposed to a much larger one in the distribution which does not reach it. Interscience is the only exception. As far as refereed journals, 96.3% of publishers are above the average, again with the exception of Inderscience, while all of them are above the average for journals in the JCR.

Subject distribution in main countries

The United States. The US collection is 33.58% and 21.61% in Ulrich's Core. Subject coverage is 78.38% in relation to Ulrich's Core, of which 47.41% of the categories are Sciences and comprise nearly 70% of journals.

Table 6. Ranking by 'Scopus' publishers according to the coverage percentage in Ulrich's Core

Publishers	%Scopus	% Ulrich	%S/U	% Ref S/U	% ISI/UC
Institute of Electrical & Electronic Engineers	0.92	0.58	88.39	97.80	94.44
B M J Publishing Group	0.25	0.17	84.38	91.67	94.44
Mary Ann Liebert, Inc. Publishers	0.45	0.30	84.21	85.45	96.88
Nature Publishing Group	0.45	0.30	82.76	86.00	100.00
M A I K Nauka – Interperiodica	0.76	0.52	82.00	86.59	97.22
Lippincot Williams & Wilkins	1.97	1.38	80.30	91.44	98.61
S. Karger AG	0.91	0.66	77.78	78.57	100.00
Elsevier	14.87	11.15	74.86	81.65	97.37
BioMed Central Ltd.	0.97	0.72	74.82	76.56	83.33
John Wiley & Sons	2.77	2.27	68.58	79.38	94.66
Masson Editeur	0.33	0.28	67.92	100.00	100.00
Blackwel	5.09	4.32	66.14	72.87	97.70
I O S Press	0.45	0.42	60.49	68.12	100.00
Taylor & Francis	5.96	6.06	55.15	62.18	95.94
Springer	8.07	8.37	54.14	63.41	97.58
Sage Publications	1.92	2.00	53.91	58.79	96.45
Georg Thieme Verlag	0.51	0.54	52.88	62.67	86.11
Oxford University Press	1.04	1.14	51.14	58.92	97.96
Cambridge University Press	0.94	1.05	50.00	66.18	100.00
World Scientific Publishing Co. Pte. Ltd.	0.45	0.54	47.12	58.75	100.00
Bentham Science Publishers Ltd.	0.29	0.35	46.27	55.56	100.00
Scientific Publishers	0.25	0.35	39.71	53.66	100.00
Haworth Press, Inc.	0.61	1.01	34.20	38.56	93.75
Kexue Chubanshe	0.45	0.76	33.10	38.14	85.71
Emerald Group Publishing Limited	0.39	0.73	29.79	33.04	96.00
Red Business Information	0.14	0.30	26.32	60.00	75.00
Interscience Publishers	0.27	0.90	16.86	17.18	80.00

Meanwhile, 35.34% of categories are from the Social Sciences with 25.46% of journals and the rest are from Humanities. Similarity between the two collections is 0.9 and the straight line adjustment is 0.82 for all categories; and 0.97 when those which are accompanied by an abbreviation in the subgraph are excluded (mainly from the Social Sciences and Humanities).

Table 7 shows categories with more than ten titles in descending order of the percentage of journals found in Ulrich's Core. Nearly 73% of the categories are over-represented, and are above the average for peer-reviewed journals. These categories mainly belong to areas related to Sciences and Engineering (69%).

United Kingdom. The collection of journals from the UK found makes up 30% of Ulrich's Core, while accounting for 23.82% of the total in Scopus. The subject coverage is 66%. There is over-representation of 82% of the categories shown in Table 8, 74% of which are from the Sciences. Also, 71% are above the average for Scopus in peer-reviewed journals, with 82% of categories from Sciences and Engineering. The correlation coefficient for whole distribution is 0.95.

Table 7. Subject ranking according to the coverage percentage in Ulrich's Core – United States

Abr.	Ulrich's subject	%Scopus	% Ulrich	%S/U	% Ref S/U
VET	Veterinary Science	0.77	0.30	56.60	63.83
ENG	Engineering	5.71	2.56	48.15	55.66
GEO	Geography	0.65	0.31	44.64	52.50
ENE	Energy	0.65	0.32	43.86	57.14
ELE	Electronics	0.65	0.33	41.67	42.55
MET	Metallurgy	0.31	0.17	38.71	46.15
DAA	Drug Abuse and Alcoholism	0.49	0.28	38.00	52.78
MED	Medical Sciences	26.65	15.20	37.89	44.88
PHY	Physics	2.48	1.42	37.65	40.65
PSY	Psychology	5.66	3.30	37.06	47.59
CHE	Chemistry	2.76	1.61	37.02	42.92
GERON	Gerontology and Geriatrics	0.88	0.52	36.56	49.25
PHAR	Pharmacy and Pharmacology	1.86	1.10	36.36	40.26
FF	Fish and Fisheries	0.26	0.16	35.71	43.48
PETR	Petroleum and Gas	0.28	0.17	35.48	50.00
BIOL	Biology	9.01	5.55	35.08	42.14
FOOD	Food and Food Industries	0.46	0.30	33.96	48.48
NUT	Nutrition and Dietetics	0.54	0.35	33.87	44.68
HAN	Handicapped	0.31	0.21	32.43	40.91
MATH	Mathematics	3.05	2.07	31.81	38.51
COMP	Computers	4.36	3.02	31.24	39.49
ENV	Environmental Studies	1.89	1.31	31.20	45.58
HOU	Housing and Urban Planning	0.36	0.25	31.11	43.33
ES	Earth Sciences	1.55	1.13	29.70	39.10
SSWE	Social Services and Welfare	0.96	0.75	27.61	34.88
PHS	Public Health and Safety	0.54	0.43	27.27	38.00
AGRI	Agriculture	1.08	0.88	26.75	41.30
AERO	Aeronautics and Space Flight	0.39	0.33	25.00	30.00
SOC	Sociology	1.52	1.43	23.05	35.85
CRIM	Criminology and Law Enforcement	0.52	0.50	22.22	37.78
HFA	Health Facilities and Administration	0.31	0.31	21.82	37.93
BE	Business and Economics	5.06	5.17	21.17	29.19
SSCW	Social Sciences: Comprehensive Works	0.75	0.81	20.00	29.67
CYABOUT	Children and Youth_About	0.31	0.37	17.91	33.33
SCW	Sciences: Comprehensive Works	0.85	1.07	17.19	23.81
COMM	Communications	0.57	0.73	16.92	29.03
POL	Political Science	1.60	2.08	16.67	30.32
ANTH	Anthropology	0.72	0.94	16.57	27.45
TRAN	Transportation	0.36	0.47	16.47	42.31
LIS	Library and Information Sciences	0.65	1.05	13.23	18.35
EDU	Education	2.89	4.79	13.05	20.77
LAW	Law	2.40	4.46	11.64	30.56
LING	Linguistics	0.52	1.25	8.93	14.60
HIS	History	0.34	3.32	2.18	4.44

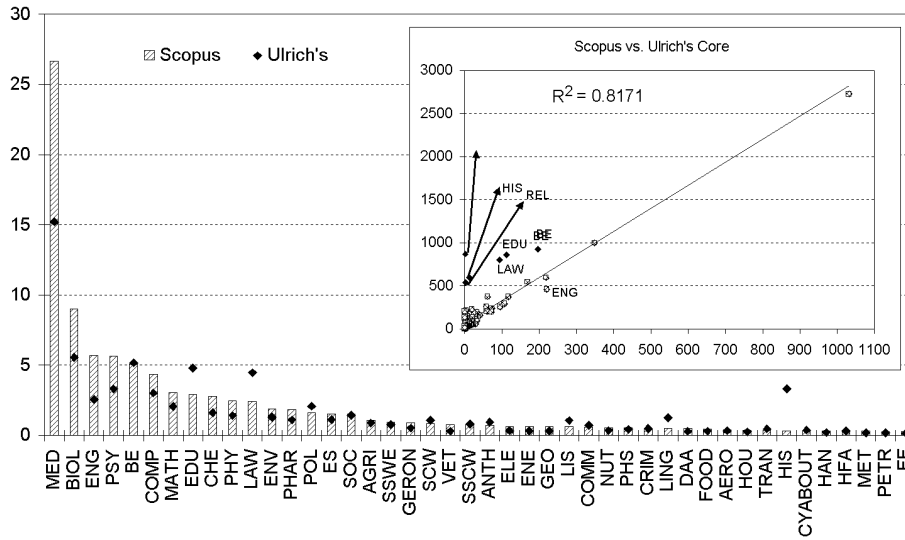


Figure 6. Percentage distribution of journals by scientific areas – United States

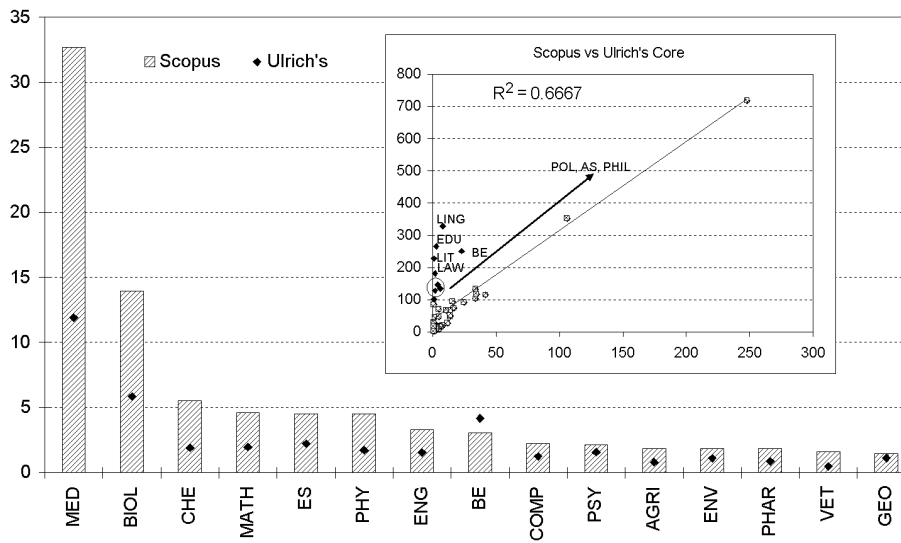


Figure 7. Percentage distribution of journals by scientific areas –United Kingdom

Table 8. Subject ranking according to the percentage of Scopus journals in Ulrich's Core – United Kingdom

Abr.	Ulrich's subject	%Scopus	% Ulrich	%S/U	% Ref S/U
ELE	Electronics	0.47	0.23	61.90	61.11
PHAR	Pharmacy and Pharmacology	2.11	1.11	57.43	62.82
PHS	Public Health and Safety	1.06	0.56	56.86	64.29
MET	Metallurgy	0.69	0.38	54.29	65.22
PHY	Physics	2.84	1.67	51.32	56.25
ENE	Energy	1.09	0.65	50.85	56.52
ENG	Engineering	5.90	3.64	48.94	56.65
ES	Earth Sciences	2.22	1.37	48.80	54.63
PLAS	Plastics	0.55	0.34	48.39	56.52
WR	Water Resources	0.36	0.23	47.62	58.82
BIOL	Biology	10.01	6.73	44.93	51.93
VET	Veterinary Science	0.47	0.32	44.83	48.15
NUT	Nutrition and Dietetics	0.62	0.42	44.74	51.72
CHE	Chemistry	3.10	2.14	43.59	52.45
GEO	Geography	1.02	0.71	43.08	53.06
MED	Medical Sciences	21.34	15.00	42.96	51.02
PSY	Psychology	3.50	2.52	41.92	47.89
STA	Statistics	0.40	0.30	40.74	45.83
HOU	Housing and Urban Planning	0.80	0.60	40.00	50.00
ENV	Environmental Studies	2.15	1.66	39.07	47.75
AGRI	Agriculture	1.42	1.14	37.50	48.57
COMP	Computers	3.31	2.72	36.84	38.46
TRAN	Transportation	1.09	0.92	35.71	38.10
MATH	Mathematics	1.97	1.69	35.06	42.37
LIS	Library and Information Sciences	1.20	1.06	34.38	50.00
SOC	Sociology	1.46	1.50	29.41	35.45
BE	Business and Economics	7.83	8.83	26.77	32.08
SCW	Sciences: Comprehensive Works	0.76	0.92	25.00	31.03
LING	Linguistics	1.38	1.69	24.68	34.44
POL	Political Science	2.95	3.88	22.95	32.05
SSCW	Social Sciences: Comprehensive Works	0.91	1.34	20.49	28.75
SSWE	Social Services and Welfare	0.58	0.93	18.82	31.11
COMM	Communications	0.44	0.71	18.46	26.83
EDU	Education	2.55	4.75	16.20	24.40
PHIL	Philosophy	0.51	1.29	11.97	13.79
HIS	History	0.98	3.30	9.00	12.79
ARCH	Archaeology	0.36	1.41	7.81	12.90
LAW	Law	0.58	2.30	7.66	15.73

The Netherlands. It represents 30.15% of the total of Scopus in Ulrich's Core and 7.53% of the Scopus collection. Its subject coverage is 62.4%. With the exception of Linguistics and Law, all the categories shown in Table 9 are over-represented, and far above the average for peer-reviewed journals, mainly from the Sciences (86%). The Pearson coefficient is 0.92. Table 9 shows those which have 10 or more journals.

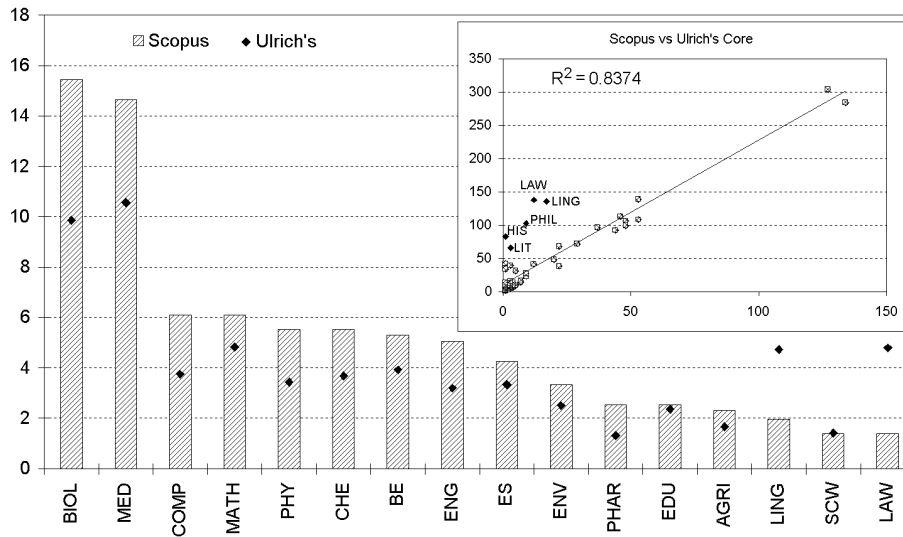


Figure 8. Percentage distribution of journals by subject areas in Ulrich's Core –The Netherlands

Table 9. Subject ranking according to the percentage of Scopus journals in Ulrich's Core –The Netherlands

Abr.	Ulrich's subject	%Scopus	% Ulrich	%S/U	% Ref S/U
PHAR	Pharmacy and Pharmacology	2.53	1.32	57.89	65.63
COMP	Computers	6.11	3.75	49.07	55.56
PHY	Physics	5.53	3.44	48.48	51.69
ENG	Engineering	5.07	3.20	47.83	51.28
BIOL	Biology	15.44	9.86	47.18	51.65
CHE	Chemistry	5.53	3.68	45.28	50.57
MED	Medical Sciences	14.63	10.56	41.78	44.35
AGRI	Agriculture	2.30	1.67	41.67	55.56
BE	Business and Economics	5.30	3.92	40.71	53.57
ENV	Environmental Studies	3.34	2.50	40.28	51.02
ES	Earth Sciences	4.26	3.33	38.54	41.77
MATH	Mathematics	6.11	4.83	38.13	43.12
EDU	Education	2.53	2.36	32.35	42.22
SCW	Sciences: Comprehensive Works	1.38	1.42	29.27	37.93
LING	Linguistics	1.96	4.72	12.50	16.67
LAW	Law	1.38	4.79	8.70	15.79

Germany. It represents 12.57% in Ulrich's Core and 6.58% of the Scopus total. It has output in 45.6% of the Ulrich categories in which Germany publishes. Out of the categories shown in Table 10, 80% are above the average in relation to the Ulrich collection, all from the Sciences, Medicine and Engineering. In relation to the country, 87% of peer-reviewed journals are above the average and all are from Sciences except Geography. The similarity value between the two collections is 0.82.

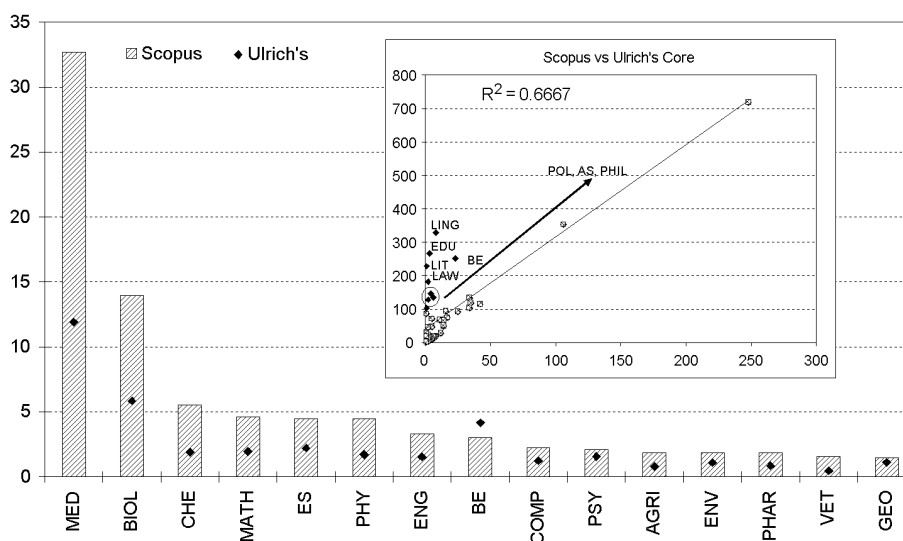


Figure 9. Percentage distribution of journals by subject areas in Ulrich's Core – Germany

Table 10. Subject ranking according to the percentage of Scopus journals in Ulrich's Core – Germany

Abr.	Ulrich's Subject	%Scopus	% Ulrich	%S/U	% Ref S/U
VET	Veterinary Science	1.58	0.46	42.86	66.67
CHE	Chemistry	5.53	1.91	36.52	41.49
MED	Medical Sciences	32.67	11.90	34.54	46.53
PHY	Physics	4.48	1.71	33.01	45.71
BIOL	Biology	13.97	5.83	30.11	48.31
MATH	Mathematics	4.61	1.95	29.66	42.50
AGRI	Agriculture	1.84	0.80	29.17	55.00
PHAR	Pharmacy and Pharmacology	1.84	0.84	27.45	52.00
ENG	Engineering	3.29	1.52	27.17	37.74
ES	Earth Sciences	4.48	2.20	25.56	41.38
COMP	Computers	2.24	1.23	22.97	36.36
ENV	Environmental Studies	1.84	1.09	21.21	50.00
PSY	Psychology	2.11	1.56	17.02	30.30
GEO	Geography	1.45	1.11	16.42	38.46
BE	Business And Economics	3.03	4.16	9.16	31.67

Subject distribution according to main publishers

Elsevier. It represents approximately 15% of the Scopus collection and 75% in relation to the whole Elsevier collection in Ulrich's Core. It has journals in 97% of Ulrich categories, 62% of which are from the Basic, Experimental and Medical Sciences (accounting for 84.77% of the number of journals), 13.86% from Social

Sciences (with 32.47% of journals) and 7.8% from Humanities (scarcely 1.31% of the titles). In all cases, the values studied are above the average (Table 11). The correlation coefficient is 0.95 and the determination coefficient is 0.99.

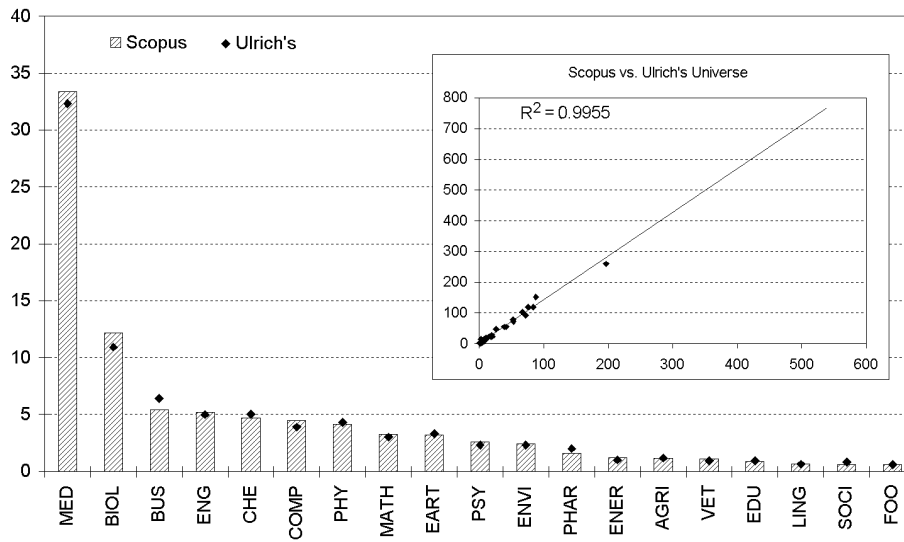


Figure 10. Percentage distribution by subject areas in Ulrich's Core – Elsevier

Table 11. Subject ranking according to the percentage of Scopus journals in Ulrich's Core – Elsevier

Abr. Subject	Subject	%Scopus	% Ulrich	%S/U	% Ref S/U
ENER	Energy	0.89	0.98	90.48	89.47
BIOL	Biology	9.26	11.03	83.90	87.91
PSY	Psychology	1.87	2.29	81.63	86.67
VET	Veterinary Science	0.79	0.98	80.95	85.00
COMP	Computers	3.23	4.02	80.23	82.93
ENVI	Environmental Studies	1.82	2.29	79.59	80.43
MED	Medical Sciences	24.50	31.56	77.63	83.86
FOO	Food and Food Industries	0.47	0.61	76.92	90.91
ENG	Engineering	3.79	4.96	76.42	79.00
MAT	Mathematics	2.48	3.32	74.65	73.91
LING	Linguistics	0.51	0.70	73.33	78.57
AGRI	Agriculture	0.89	1.22	73.08	76.00
PHAR	Pharmacy and Pharmacology	1.22	1.68	72.22	73.53
EART	Earth Sciences	2.43	3.41	71.23	73.53
PHY	Physics	3.09	4.44	69.47	70.97
CHE	Chemistry	3.55	5.38	66.09	71.13
EDU	Education	0.65	1.03	63.64	92.86
BUS	Business and Economics	4.02	6.87	58.50	83.16

Springer. Its publications comprise 8% of Scopus, in sharp contrast with its presence of 54.14% in Ulrich’s Core. Coverage amounts to 74.42%. The distribution amongst Science categories is 62.5% with 84.25% of the collection’s journals, 29.69% for Social Sciences with 13.68% of the titles and 7.81% of categories for Humanities with 1.95% of the journals. With regards to categories having over ten titles, it surpasses all the parameters (Table 12). The similarity value with Ulrich’s Core is 0.99.

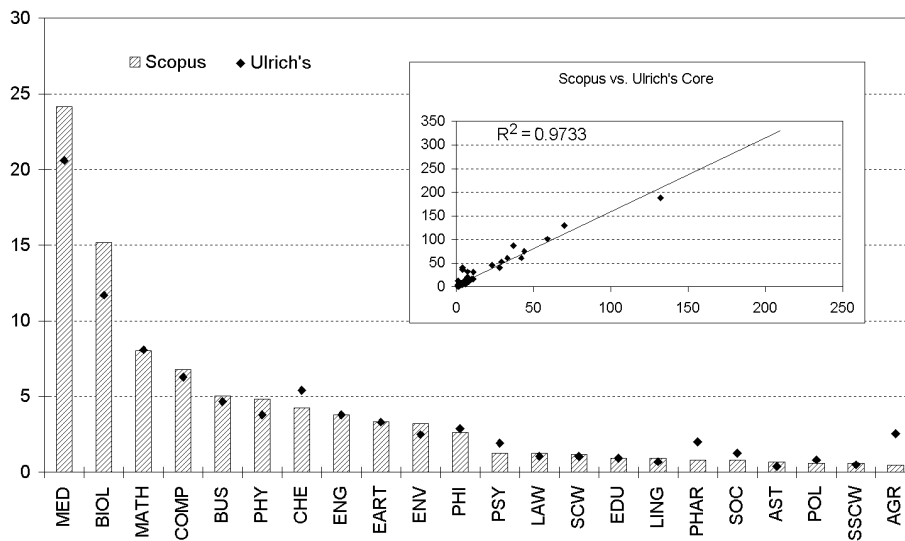


Figure 11. Percentage distribution by subject areas in Ulrich’s Core – Springer

Table 12. Subject ranking according to the percentage of Scopus journals in Ulrich’s Core – Springer

Abr	Subject	%Scopus	% Ulrich	%S/U	% Ref S/U
BIOL	Biology	15.17	11.70	70.21	77.30
PSY	Psychology	3.22	2.49	70.00	71.79
ENG	Engineering	4.83	3.80	68.85	78.85
PHAR	Pharmacy and Pharmacology	1.26	1.06	64.71	78.57
MED	Medical Sciences	24.14	20.60	63.44	73.38
SOC	Sociology	1.15	1.06	58.82	71.43
PHY	Physics	5.06	4.67	58.67	70.49
COM	Computers	6.78	6.29	58.42	66.25
EAR	Earth Sciences	3.33	3.30	54.72	62.22
CHE	Chemistry	3.79	3.80	54.10	60.78
MATH	Mathematics	8.05	8.09	53.85	64.22
ES	Environmental Studies	2.64	2.86	50.00	67.74
BE	Business and Economics	4.25	5.41	42.53	50.72
EDU	Education	1.26	1.93	35.48	40.00

Taylor & Francis. Precisely 5.96% of Scopus journals pertain to this publisher, whereas they make up 55.15% the Ulrich collection. It covers just over 73% of the Ulrich Core categories, 55.38% of which are from scientific areas (accounting for 64.33 journals), 40% from areas associated with Social Sciences (with 32.87%) and 4.62% from Humanities (2.65% of the total Scopus collection). Table 13 shows categories holding more than 10 titles; with the exception of History and Education in the variable for peer-reviewed journals, all are over-represented. The similarity coefficient is 0.91. Figure 12 shows the distribution for both collections.

Table 13. Subject ranking according to the percentage of Scopus journals in Ulrich's Core – Taylor & Francis

Abr.	Subject	%Scopus	% Ulrich	%S/U	% Ref S/U
HOU	Housing and Urban Planning	1.71	1.12	84.62	90.91
MED	Medical Sciences	21.81	14.26	84.34	86.36
PHAR	Pharmacy and Pharmacology	2.18	1.46	82.35	87.50
ES	Environmental Studies	4.05	2.75	81.25	84.62
BIOL	Biology	6.70	4.73	78.18	90.91
PHY	Physics	3.43	2.49	75.86	78.57
CHE	Chemistry	5.92	4.38	74.51	80.85
PSY	Psychology	6.85	5.24	72.13	77.36
MATH	Mathematics	2.02	1.63	68.42	64.71
ENG	Engineering	4.67	3.87	66.67	72.97
COM	Computers	1.87	1.72	60.00	63.16
BE	Business and Economics	6.54	6.10	59.15	72.73
POL	Political Science	5.45	7.65	39.33	49.23
EDU	Education	3.89	8.51	25.25	29.87
HIS	History	1.56	3.87	22.22	27.03

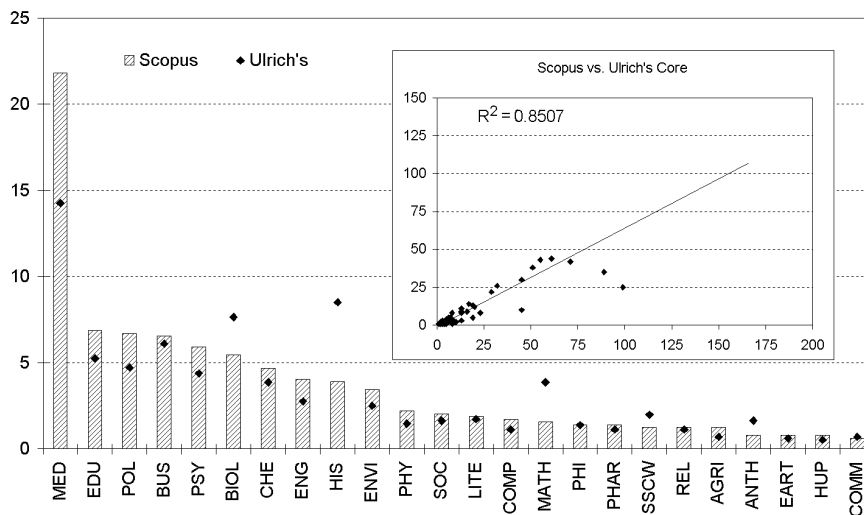


Figure 12. Percentage distribution by subject areas in Ulrich's Core – Taylor & Francis

Blackwell. It represents 5% of Scopus, and 66.14% of the publisher total in Ulrich's Core. Its subject coverage is 83.33%, with 52% of the categories associated with Sciences (accounting for 67.4% of the total journals), 46% from Social Sciences (with 29.5%), and 12% from Humanities (with a share just under 3% of journals). The similarity value with Ulrich's Core is 0.99. It surpasses the average in all aspects studied.

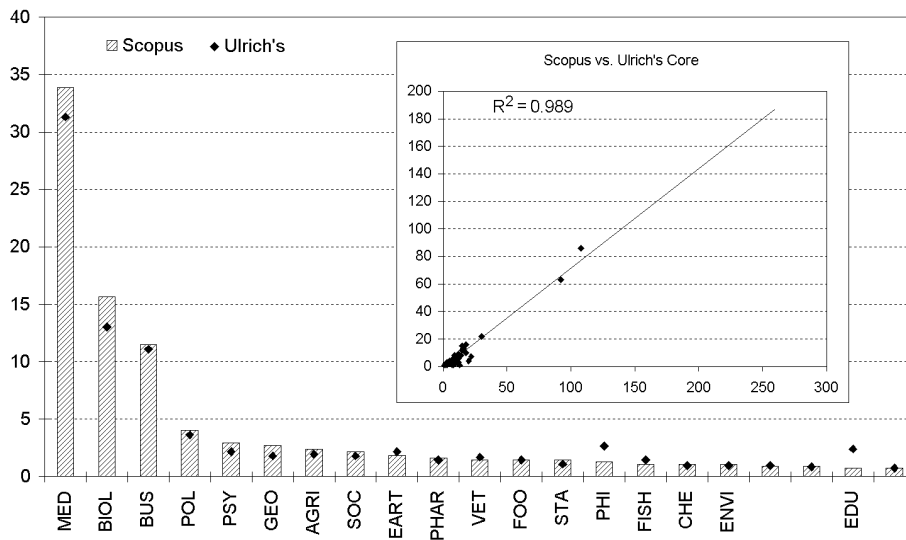


Figure 13. Percentage distribution by subject areas in Ulrich's Core – Blackwell

Table 14. Subject ranking according to the percentage of Scopus journals in Ulrich's Core – Blackwell

Abr.	Subject	%Scopus	% Ulrich	%S/U	% Ref S/U
GEO	Geography	2.73	1.81	100.00	100.00
PSY	Psychology	2.91	2.17	88.89	93.33
AGR	Agriculture	2.37	1.93	81.25	86.67
SOC	Sociology	2.19	1.81	80.00	84.62
BIOL	Biology	15.66	13.01	79.63	89.25
POL	Political Science	4.01	3.61	73.33	78.57
MED	Medical Sciences	33.88	31.33	71.54	79.51
BE	Business and Economics	11.48	11.08	68.48	70.73
ES	Earth Sciences	1.82	2.17	55.56	56.25

Conclusions

The results described here allow us to draw a profile of Scopus in terms of its coverage by areas – geographic and thematic – and the significance of peer-review in its publications. Both these aspects are highly pragmatic considerations for the users of scientific databases, and in particular for the authors and the policy makers who rely on database presence as a main criterion for scientific promotion. Our most important findings are:

- Fifteen percent of Scopus journals are published in languages other than English, as opposed to 26% of Ulrich's Core. This would explain Scopus's greater coverage of scientific output journals with respect to popular science journals, as typically found in the Social Sciences and Arts and Humanities.
- As far as geographical coverage is concerned, parallels can be seen in the distribution of the two collections. Scopus's distribution resembles that of Ulrich's except in the United Kingdom, Netherlands and Germany. The United States is the country with the most journals in Scopus (due to scientific size), with substantial distance from the Ulrich reference. In the U.S. and U.K. on the whole, the subject area distribution is clearly inclined towards Medicine, Biology, Engineering, Psychology and Economics; whereas in Netherlands and Germany a specialisation in the the areas of Computing, Mathematics, Physics and Chemistry is observed.
- The vast majority of publishers (97%) are over-represented in both collections (Ulrich's Core and Scopus), in contrast with their wide diversity of the two regarding distribution by subject areas, countries and language of publication.
- As far as the main publishers are concerned, Elsevier and Blackwell provide most coverage on a worldwide level and show a fairly even thematic distribution. In Ulrich, Blackwell is better represented than Elsevier. The Springer Verlag stands out in Medicine, Biology, Computing and Psychology, while Taylor & Francis do so in Chemistry, Medicine, Environmental Studies and Engineering.
- Statistically speaking then, the coverage provided by Scopus is balanced in terms of subject areas, languages and editors when compared with Ulrich's Core. In general we can say that Scopus has quite homogenous global representation in nearly all areas except Arts and Humanities, a fact pointed out in previous studies and shown on the Scopus website. Scopus covers 35% of Social Science journals worldwide.

- One of the areas not specifically dealt with in this study but that points us toward future research projects is the analysis of Scopus's temporary coverage trends. We should underline the fact that Scopus is a database with criteria similar to those of Thomson ISI, not only in the development of the collection but also in its coverage on the world level. There are, however, significant differences regarding output and citation. Though Scopus's size is its strength, this is not reflected in citation until the 90's.

To very briefly conclude, and with possible future bibliometric studies in mind, the above considerations conform an important part of the context of scientific output and evaluation, and should be taken into account so as to avoid bias in the comparison of research results in diverse domains or at different aggregation levels.

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Appendix

Table 15. List of Abbreviations for Ulrich's Core Categories
(The cells in italics show those categories in Scopus which do not have journals)

Abr.	Ulrich's subject	Abr.	Ulrich's subject
MED	Medical sciences	INSU	Insurance
ENG	Engineering	ASI	Asian studies
BUS	Business and economics	LITE	Literature
CHE	Chemistry	FIR	Fire prevention
PSY	Psychology	REAL	Real estate
PHY	Physics	BIRT	Birth control
COMP	Computers	SG	Sports and games
MAT	Mathematics	MACHI	Machinery
EART	Earth sciences	HPR	Heating plumbing and refrigeration
PHAR	Pharmacy and pharmacology	AW	Animal welfare
ENV	Environmental studies	LPR	Literary and political reviews
AGRI	Agriculture	LR	Leisure and recreation
EDU	Education	PHOT	Photography
POL	Political science	PAC	Packaging
BIOL	Biology	CT	Clothing trade
SCW	Sciences: comprehensive works	RUB	Rubber
GEO	Geography	BEV	Beverages
LAW	Law	HCW	Humanities: comprehensive works
SOC	Sociology	OCCU	Occupations and careers
VET	Veterinary science	PBT	Publishing and book trade
MET	Metallurgy	ART	Art
PHS	Public health and safety	JOUR	Journalism
ENE	Energy	APR	Advertising and public relations
ND	Nutrition and dietetics	CEP	Consumer education and protection
SCCW	Social sciences: comprehensive works	MEN	Men's health
GG	Gerontology and geriatrics	BC	Beauty culture
TRAN	Transportation	HOT	Hotels and restaurants
ELE	Electronics	LFI	Leather and fur industries
LIS	Library and information sciences	TOB	Tobacco
FF	Forests and forestry	PRIN	Printing
HIS	History	PTC	Patents trademarks and copyrights
PET	Petroleum and gas	CD	Cleaning and dyeing
LIN	Linguistics	BIB	Bibliographies
COMM	Communications	BIOG	Biography
ASF	Aeronautics and space flight	HOB	Hobbies
FFI	Food and food industries	HOM	Homosexuality
SSW	Social services and welfare	MUS	Music

Table 15. (cont.)

ANTH	Anthropology	NAS	Native american studies
HUP	Housing and urban planning	PO	Parapsychology and occultism
DAA	Drug abuse and alcoholism	PHI	Philately
HFA	Health facilities and administration	SRR	Sound recording and reproduction
METER	Meteorology	AH	Arts and handicrafts
AST	Astronomy	IDD	Interior design and decoration
STA	Statistics	MP	Motion pictures
MMI	Mines and mining industry	CLU	Clubs
WR	Water resources	NEE	Needlework
PALE	Paleontology	AIS	Abstracting and indexing services
OHS	Occupational health and safety	ANT	Antiques
PHI	Philosophy	AST	Astrology
TCW	Technology: comprehensive works	CYABS	Children and youth_abstracting bibliographies statistics
FISH	Fish and fisheries	CY	Children and youth_for
CLE	Criminology and law enforcement	CD	Civil defense
PLAS	Plastics	CLA	Classical studies
PS	Population studies	CA	College and alumni
TIF	Textile industries and fabrics	DAN	Dance
CONS	Conservation	EGA	Encyclopedias and general almanacs
BC	Building and construction	FOL	Folklore
PA	Public administration	GH	Genealogy and heraldry
AM	Alternative medicine	GT	Giftware and toys
CYA	Children and youth_about	HE	Home economics
PFH	Physical fitness and hygiene	HY	How-to and do-it-yourself
ARCH	Archaeology	JCW	Jewelry clocks and watches
CERAM	Ceramics glass and pottery	LU	Labor unions
HANDI	Handicapped	LIF	Lifestyle
WS	Women's studies	MATR	Matrimony
GH	Gardening and horticulture	MC	Meetings and congresses
WH	Women's health	MEI	Men's interests
INST	Instruments	MES	Men's studies
ARCHIT	Architecture	MAG	Museums and art galleries
TT	Travel and tourism	NAP	New age publications
REL	Religions and theology	NUM	Numismatics
METRO	Metrology and standardization	PETS	Pets
MIL	Military	THE	Theater
ETH	Ethnic interests	WI	Women's interests
GIP	General interest periodicals	FUN	Funerals
PP	Paper and pulp	SB	Shoes and boots
PPC	Paints and protective coatings	SIL	Singles' interests and lifestyles