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Scientific journal publishers and omitted citations in bibliometric databases: Any relationship?

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ABSTRACT

Omitted citations – i.e., missing links between a cited paper and the corresponding citing papers – are the main consequence of several bibliometric database errors.

This paper investigates the possible relationship between omitted citations and publishers of the relevant citing papers. This relationship is potentially meaningful because: (i) publishers generally impose editorial styles, which could affect database errors, and (ii) some publishers may be more efficient than others in detecting and correcting pre-existing errors in the manuscripts to be published, reducing the risk of database errors.

Based on an extensive sample of scientific papers in the Manufacturing Engineering field, this study examines the citations omitted by the Scopus and WoS databases, using a recent automated algorithm. Major results are that: (i) there are significant differences in terms of omitted-citation rate between publishers and (ii) the omitted-citation rates of publishers may vary depending on the database in use.

1. Introduction and literature review

Bibliometric databases, like any database, are not free from errors. Despite the improved accuracy over the past ten years – probably due to the systematic employ of automatic tools for correcting errors in cited article lists by editors and database administrators (Adam, 2002) – the problem is far from being solved. This is proven by (i) several recent articles documenting the existence of errors of different nature – e.g., (Franceschini & Maisano, 2011a; Jacsó, 2012) – and (ii) the fact that bibliometric database staff constantly encourage users to report any noticed inaccuracy.

A synthetic classification of the major database errors is reported in Table 1, distinguishing between authors' and database mapping errors. The contributions by Buchanan (2006), Jacsó (2006) and Li, Burnham, Lemley, and Britton (2010) and Olensky (2013) show that one of the main consequences of these errors is represented by omitted citations, i.e., citations that should be ascribed to a certain (cited) paper but, for some reason, are lost. In other terms, the link between citing and cited article is not established by the database.

Even though the scientific literature reports numerous notifications of blunders (sometimes grotesque!) by Google Scholar (Labbé, 2010), it often ignores the citations omitted by the two major multidisciplinary databases: Scopus and Web of Science (WoS). According to the study by Buchanan (2006), citations omitted by WoS are likely to be around 5–10%

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1751-1577/

Table 1
Classification of bibliometric database errors according to Buchanan (2006).

Error type	Author errors	Database mapping errors
Definition	Errors made by authors when creating the list of cited articles for their publication	Failure to establish an electronic link between a cited article and the corresponding citing articles that can be attributed to a data-entry error
Examples	- Errors in name and initials of the first author - Errors in publication title - Errors in publication year - Errors in volume number - Errors in pagination.	- Transcription errors - Target-source article record errors - Cited article omitted from a cited-article list - Reason unknown

of the "true" number of citations (i.e., the number of citations that would be indexed in the ideal case of absence of omitted citations).

Unfortunately, most of the contributions on database errors rely on the manual analysis of small samples of scientific articles and therefore results are not very robust statistically. To overcome this obstacle, Franceschini, Maisano, and Mastrogiacomo (2013) introduced an algorithm for estimating a database's omitted-citation rate automatically. This algorithm requires the combined use of two or more bibliometric databases and is based upon the hypothesis that the mismatch between the citations occurring in one database and another one is evidence of possible errors/omissions.

The automated algorithm has been recently applied by Franceschini, Maisano, and Mastrogiacomo (2014) to a large set of journals in the Manufacturing field, showing that – with a few exceptions – the differences in terms of omitted-citation rate (p) between these journals is included between 4% and 10% for WoS and between 2% and 8% for Scopus. The same study showed that omitted citations are usually "isolated accidents", which concern a very small portion of the articles published by a certain journal; nevertheless, these errors may affect indicators based on citation statistics significantly.

Going back to the classification in Table 1, it is not unreasonable to guess that some editorial styles imposed by certain publishers could hamper the correct identification or the citing/cited papers by a database. For example, citing papers containing lists of references with (i) abbreviated journal titles (ISO 4:1997, 1997; Thomson Reuters, 2014a), (ii) first authors' names only, or (iii) omitted paper titles (not unusual for journals in the Physics field) could complicate the identification of cited papers.

Apart from the list of references, other features concerning publishers could affect the database propensity to omit citations, such as: the type of data made available (PDF or HTML version of the articles) and the ability to detect and correct pre-existing errors in the cited article list of a manuscript, before publication. We remark that database errors often result from pre-existing author errors, which are unnoticed throughout the production/indexing process of a paper. In the best cases, reviewers, publishers or even database staff (in chronological sequence) are able to detect and correct them. In the worst cases, they may ignore these errors and even generate new ones.

The objective of this paper is to investigate the possible relationship between omitted citations and publishers of the relevant citing papers (e.g., Elsevier, Springer, Taylor & Francis, etc.). The analysis relies on the same dataset used in (Franceschini et al., 2014) – which concern (cited) papers in the field of Manufacturing Engineering – and focuses the attention on the publishers of the citing articles; omitted citations are examined from the perspective of both Scopus and WoS.

The remaining of the paper is organized into four sections. Section 2 recalls the automated algorithm for analysing omitted citations. Section 3 provides a detailed illustration of the methodology of data collection and analysis. Section 4 presents the analysis results. The concluding section summarizes the original contributions of this paper, focusing the attention on the relevant implications, limitations and ideas for future research.

2. Automated algorithm for analysing the omitted citations

Before recalling the algorithm, we present an introductory example to illustrate how it works. Let us consider a fictitious paper of interest indexed by Scopus and WoS. The number of citations received by this paper is 13 in Scopus and 12 in WoS (see Table 2).

The union of the citations recorded by the two databases is a total of nineteen citations. Among the citing articles, only nine belong to sources (i.e., journals or conference proceedings) officially covered by both databases (highlighted in grey in Table 2). Focusing on these nine "theoretically overlapping" (TO) citing articles, two are omitted by Scopus (but not by WoS) and one is omitted by WoS (but not by Scopus). Therefore, from the perspective of the paper of interest, a rough estimate of the omitted-citation rate is $2/9 \approx 22.2\%$ in Scopus and $1/9 \approx 11.1\%$ in WoS. The same reasoning can be extended to multiple papers of interest and more than two bibliometric databases.

Let us now focus attention on the automated algorithm, which is based on the combined use of two bibliometric databases (Scopus and WoS in this case) and can be summarized in three steps:

1. Identify a set of (P) papers of interest, indexed by both the databases.

Table 2
Citation statistics relating to a fictitious article, according to Scopus and WoS. The union of the citations recorded by the two databases (see the first column) is a total of nineteen citations. Among the citing articles, only nine belong to sources officially covered by both databases (highlighted in grey).

Citing Article No.	Citations in	
	Scopus	WoS
1	√	
2		√
3	√	√
4	√	√
5	√	√
6	Omitted	√
7		√
8	√	√
9	√	√
10	√	
11	Omitted	√
12	√	√
13		√
14	√	Omitted
15	√	
16	√	
17	√	
18		√
19	√	
Total	13	12

2. For each (ith) paper of the set, identify the TO citing papers, defined as the portion of documents issued by journals officially covered by Scopus and WoS. The number of TO citing papers (or citations) concerning the ith paper of interest will be denoted as γ_i.
3. For each (ith) paper of the set and for each database, determine the portion of TO citations that do not occur in it and classify them as omitted citations (ω_i). The omitted citation rate (p) relating to the P papers of interest, according to a database, can be estimated as:

$$\hat{p} = \frac{\sum_{i=1}^{P} \omega_i}{\sum_{i=1}^{P} \gamma_i}. \tag{1}$$

We emphasize that p is estimated on the basis of (i) a set of papers of interests and (ii) a portion of the total citations that they obtained (i.e., that ones related to citing articles purportedly covered by both the databases).

For a more detailed description of the algorithm, we refer the reader to Franceschini et al. (2013).

3. Data collection and analysis

This study is based on a set of scientific journals (i) included in the ISI Subject Category of *Engineering-Manufacturing* (by WoS[1]) and (ii) covered by Scopus. We chose the Manufacturing Engineering field since it is the area of expertise of the authors. The fact that journals are covered by (at least) two databases is an essential requirement for applying the algorithm.

For each journal, we selected the articles published in the time-window from 2006 to 2012 and indexed by both databases. This time-window meshes together three requirements: (i) articles should not be too recent, so that they have accumulated a certain amount of citations, (ii) articles should not be too old, so that our analysis can bring out the current error propensity of databases, and (iii) the overall dataset should be relatively large, for the results to be statistically robust.

Journal titles, the corresponding ISSN codes and the number of papers examined are reported in Table A.1 (in Appendix). We excluded articles without the DOI code or whose DOI code is not indexed by both databases, as they would be difficult to disambiguate. We noticed that, at the moment of the analysis, DOI codes of most of the articles issued by "International Journal of Design" and "International Journal of Industrial Engineering – (Theory) Applications and Practice" were reported by Scopus but not by WoS. Also, DOI codes (if present) of the articles issued by "Manufacturing Engineering" were not reported by any of the databases in use. Therefore, these three journals were excluded from the analysis. As regards the remaining 34 journals, only a few articles were excluded: mainly editorials, notes and articles on special issues with unindexed DOI code.

For each of the Manufacturing journal articles, we collected the TO citing articles with the relevant information (i.e., issue year, authors, DOI code, journal title, journal publisher, etc.), from both Scopus and WoS. Cited and citing articles

[1] According to the 2011 JCR (Thomson Reuters, 2014a,b).

Table 3
Composition of the dataset in terms of cited and citing papers. P is the total number of articles of interest, while the last two columns report the number of "theoretically overlapping" (TO) citations given by (citing) papers from various journals in the scientific literature.

Year	P	TO citing papers	
		Issued in that year and relating to the totality of the papers of interest	Issued in the whole 2006–2012 period and relating to papers issued in that year
2006	3559	280	27,146
2007	3630	1966	26,685
2008	4011	6369	24,841
2009	4069	13,406	18,292
2010	3623	21,189	9975
2011	3953	30,717	4824
2012	4319	38,898	1059
Total	27,164	112,822	112,822

were selected using a 2006–2012 time-window. The official lists of documents covered by the databases in use – which are essential for determining the TO citing papers – were retrieved from databases' websites (Scopus Elsevier, 2014; Thomson Reuters, 2014b). Data collection was carried out in June 2013.

The resulting dataset includes more than 27,000 articles of interest with more than 112,000 TO citing papers; for more details see Table 3. Table 4 shows the (10) major publishers in terms of TO citing papers examined; publishers related to a percentage portion of TO citing papers lower than 1.5% are conventionally grouped in the category "Others".

Many publishers embrace several sub-publishers; Table A.2 (in Appendix) specifies the sub-publishers related to the (10) major publishers in Table 4. For the purpose of simplicity and convenience, the rest of the analysis will refer the main publishers only.

For any combination between publisher and database in use, we have a relatively large sample of TO citing papers, which can be used for estimating the corresponding omitted-citation rate (p); the relationship in Eq. (1) can be used, being:

$\hat{p}$, the estimate of the omitted-citation rate related to the TO citing papers from a certain publisher, according to the database in use;
γ_i, the number of TO citing papers relating to the ith article of interest and issued by a certain publisher;
ω_i, the portion of the γ_i TO citations – given by papers issued by a certain publisher – which are omitted by the database in use;
P, the number of (cited) articles of interest (see the last row of Table 3).

Being $\hat{p}$ just an estimate of p – albeit the best possible – a relevant symmetrical $(1-\alpha)$ confidence interval (CI) can be constructed as:

$$\hat{p} \pm z_{1-\alpha/2}\sqrt{\frac{\hat{p}\cdot\left(1-\hat{p}\right)}{\sum_{i=1}^{P}\gamma_i}}, \tag{2}$$

Table 4
List of the (ten) major publishers and relevant abbreviations. Publishers are sorted decreasingly with respect to the number of TO citing articles; publishers related to a percentage portion of TO citing papers lower than 1.5% are conventionally grouped in the category "Others".

Publisher	Abbr.	TO citing papers	Percentage portion (%)
Elsevier	ELS	39,890	35.4
Springer	SPR	13,617	12.1
Taylor & Francis	T&F	12,081	10.7
Wiley-Blackwell	WIL	3644	3.2
Institute of Electrical and Electronics Engineers	IEEE	3599	3.2
Professional Engineering Publishing Ltd.[a]	PEP	3134	2.8
American Society of Mechanical Engineers	ASME	2985	2.6
SAGE	SAGE	2078	1.8
Trans Tech Publications Ltd.	TTP	1716	1.5
Emerald	EME	1665	1.5
Others	OTH	28,413	25.2
Total		112,822	100.0

[a] The entire set of journals published by Professional Engineering Publishing Ltd. are now published by SAGE. However, at the moment of the data collection (June 2013), these two publishers were still distinct; therefore, they will be treated separately.

Table 5
Main results of the analysis about the omitted-citation rate of publishers. Citing and cited articles were issued from 2006 to 2012. Statistics are determined for both Scopus and WoS.

Publisher	$\sum_{i=1}^{P} \gamma_i$	(a) Scopus				(b) Wos			
		$\sum_{i=1}^{P} \omega_i$	$\hat{p}$ (%)	95% *CI*		$\sum_{i=1}^{P} \omega_i$	$\hat{p}$ (%)	95% *CI*	
ELS	39,890	950	2.4	2.2	2.5	3067	7.7	7.4	8.0
SPR	13,617	607	4.5	4.1	4.8	1013	7.4	7.0	7.9
T&F	12,081	421	3.5	3.2	3.8	915	7.6	7.1	8.1
WIL	3644	723	19.8	18.5	21.2	183	5.0	4.3	5.7
IEEE	3599	138	3.8	3.2	4.5	277	7.7	6.8	8.6
PEP	3134	181	5.8	4.9	6.6	256	8.2	7.2	9.1
ASME	2985	116	3.9	3.2	4.6	338	11.3	10.2	12.5
SAGE	2078	71	3.4	2.6	4.2	142	6.8	5.7	7.9
TTP	1716	49	2.9	2.1	3.7	0	0.0	0.0	0.0
EME	1665	51	3.1	2.2	3.9	146	8.8	7.4	10.2
OTH	28,413	1297	4.6	4.2	4.9	1763	6.2	5.8	6.6
Total	112,822	4604	4.1	3.9	4.3	8100	7.2	6.9	7.2

$\sum \gamma_i$ is the total number of TO citations.
$\sum \omega_i$ is the total number of omitted citations relating to each publisher, from the perspective of a database.
$\hat{p}$ is the omitted-citation rate relating to each publisher, from the perspective of a database.
The 95% *CI* around $\hat{p}$ is obtained applying the approximated relationship in Eq. (2).

being:

α the type-I error;
$z_{1-\alpha/2}$ the unit normal deviate corresponding to $1-\alpha/2$. E.g., for a symmetrical 95% *CI* $\alpha = 5\%$, therefore $z_{97.5\%} \approx 2$.

The *CI* construction in Eq. (2) is grounded on the following considerations:

- For a generic sample consisting of $n = \sum_{i=1}^{P} \gamma_i$ TO citations, the number of omitted citations will be a binomially distributed variable with mean value $n \cdot p$ and variance $n \cdot p(1-p)$;
- The aforesaid binomial distribution can be approximated by a normal distribution with the same mean value and variance. This approximation is acceptable in the case $n \cdot p \geq 5$ (Montgomery, 2005), which is generally satisfied when considering relatively large sets of TO citations.
- Based on the previous approximation, the percentage of omitted citations for a sample of n TO citations will be a normally distributed variable with mean value p and variance $p(1-p)/n$. Since p is not known, it can be replaced by its best estimate $\hat{p}$.

In conclusion, Eq. (2) defines a symmetric *CI* around $\hat{p}$, which – with a probability $(1-\alpha)$ – will include the "true" p value.

4. Results

Table 5 contains the omitted-citation rates and other data concerning publishers, for both Scopus and WoS.

An interesting aspect is that there are significant differences between publishers, from the perspective of both Scopus and WoS. For example, as regards Scopus, the $\hat{p}$ value of (citing) articles issued by Springer is significantly higher than that of articles issued by Taylor and Francis and, in turn, Elsevier: since the 95% *CI*s around the $\hat{p}$ values are not overlapped (see the graph in Fig. 1(a)), the "true" p values of these publishers are likely to be different.[2] Analogous considerations apply to WoS (see Fig. 1(b)); e.g., the $\hat{p}$ value of (citing) articles issued by the American Society of Mechanical Engineers is significantly higher than that of articles issued by Taylor & Francis and, in turn, Wiley-Blackwell.

The previous result is corroborated by the fact that differences between publishers are relatively stable over time. For example, the two bar charts in Fig. 2 show the annual $\hat{p}$ values – i.e., considering the portion of citing articles and relevant

[2] Authors are aware that a more rigorous testing should be that of the differences between $\hat{p}$ values of pairs of publishers (Schenker and Gentleman, 2001). The fact remains that the qualitative approach in use is simpler and more straightforward.

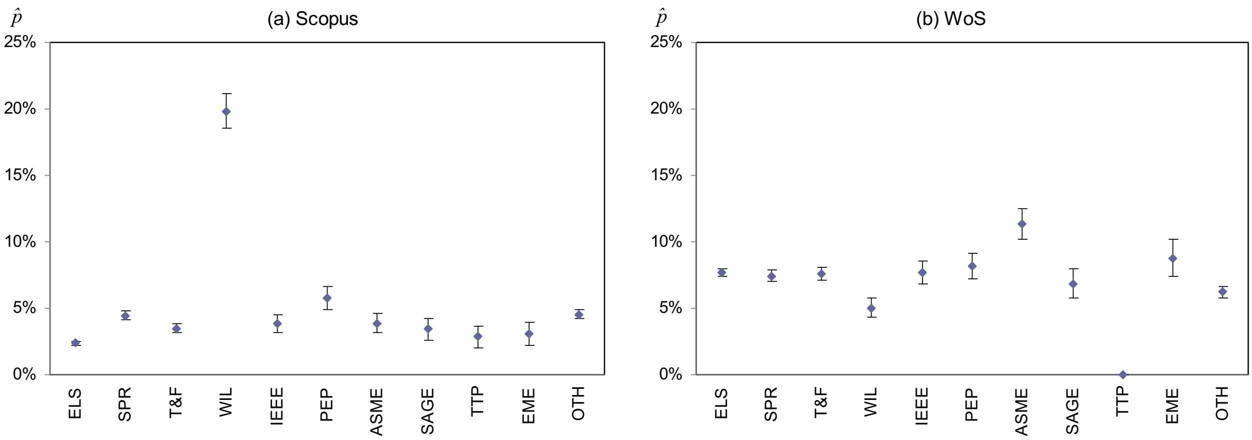

Fig. 1. $\hat{p}$ values and relevant 95% *CIs*, according to (a) Scopus and (b) WoS. Numerical data are reported in Table 5. Publishers' abbreviations are explained in Table 4. Citing articles and relevant omitted citations were issued in the 2006–2012 period.

omitted citations issued in one year only (not in the entire 2006–2012 period) – related to Taylor & Francis and Wiley-Blackwell. According to WoS, Wiley-Blackwell has a $\hat{p}$ lower than that of Taylor & Francis in any of the years examined; according to Scopus, results are almost completely reversed. Not surprisingly, $\hat{p}$ values relating to the years 2006 and 2007 are rather instable; the reason is that in these two years the number of TO citing papers is relatively small (i.e., often lower than 100) and therefore $\hat{p}$ estimates are not very robust. Table A.3 (in Appendix) contains numerical data concerning the 10 major publishers examined.

Going back to the graph in Fig. 1, it can be noticed that the $\hat{p}$ values relating to WoS are greater than those relating to Scopus for all publishers except Wiley-Blackwell, confirming the result of previous analyses (Franceschini et al., 2013, 2014). In addition, there is no correlation between the publishers' $\hat{p}$ values, according to the two databases: see the scatter plot in Fig. 3, in which the coefficient of determination (R^2) of the tendency line is very low.

Since omitted citations are usually "isolated accidents" affecting a relatively small number of articles (Franceschini et al., 2014), it may be interesting to observe how they are distributed between journals edited by the same publisher. Table A.4 (in Appendix) contains the list of journals associated with each publisher; for each journal, the total number of TO citing papers and the percentage of omitted citations are reported; journals with no TO citing papers are not included in the list. It can be noticed that, despite the relatively large journals' differences in terms of number of TO citing articles, differences in terms of $\hat{p}$ are not huge. For the purpose of example, see the diagrams in Fig. 4 concerning Elsevier's and Springer's (citing) journals. This result reinforces the hypothesis that TO citing papers sharing the same publisher form a relatively homogeneous population in terms of omitted-citation rate. An exception is represented by the citations coming from Wiley-Blackwell's journals and omitted by Scopus: most of them are concentrated in just five journals in the field of Chemistry and Materials Science (i.e., Journal of Applied Polymer Science; Polymer Composites; Polymer Engineering and Science; Journal of Polymer Science,

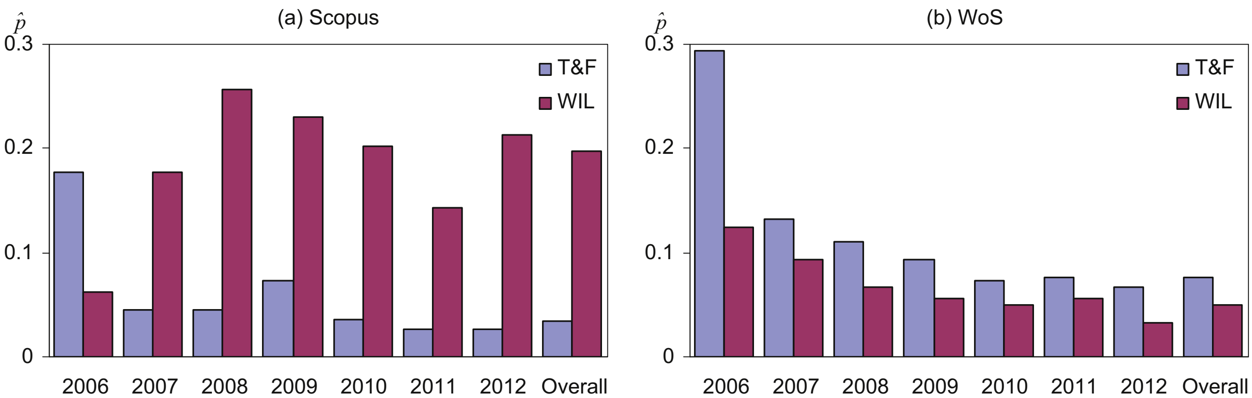

Fig. 2. Annual $\hat{p}$ values relating to the Wiley-Blackwell and Taylor & Francis publishers, depending on the issue year of the TO citing articles, according to (a) Scopus and (b) WoS (see numerical data in Table A.3, in Appendix).

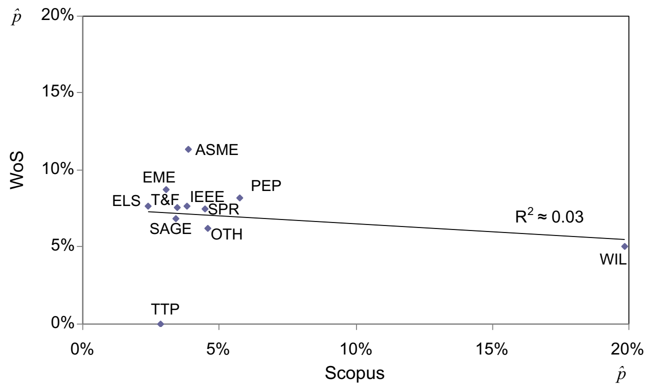

Fig. 3. Scatter plot representing the publishers' $\hat{p}$ values, according to Scopus and WoS. The graph highlights a lack of correlation between the two databases. Numerical data are reported in Table 5. Publishers' abbreviations are explained in Table 4.

Part B: Polymer Physics; Journal of Vinyl and Additive Technology – see Table A.4, in Appendix). For some reason, the Scopus database seems to have serious problems in indexing the citations from these journals.

5. Discussion and final remarks

Summarizing, two are the major findings of this paper: (i) for each of the two databases in use (Scopus and WoS), some publishers are more "critical" than others in terms of $\hat{p}$ values, and (ii) there is a general lack of correlation between databases; for example, the most critical publisher for Scopus is Wiley-Blackwell ($\hat{p} = 19.8\%$), while for WoS is the American Society of Mechanical Engineers ($\hat{p} = 11.3\%$).

This paper provided a "snapshot" of the distribution of omitted-citation errors among publishers, which is potentially interesting for (at least) three categories of subjects:

- Individual researchers, research institutions or librarians involved in bibliometric evaluations of the scientific output (Franceschini & Maisano, 2011b), as it reveals a different incidence of database errors, depending on the combination between database in use and publishers of the citing papers.
- Publisher staff, as it may address the identification of editorial styles or conventions, which may affect database errors.
- Bibliometric database staff, as it can reveal differences between Scopus and WoS, as regards their efficiency in detecting and correcting pre-existing errors in the published documents.

Unfortunately, devising practical justifications of the previous results is far from simple. In the absence of firm evidence, we can only make some reasonable assumptions:

- Some publishers make available better-structured data concerning new articles (e.g., DOI codes, full author names of the cited papers, etc.), favouring the reduction of database errors.
- Articles by some publishers are "cleaner" than those by other ones, favouring the reduction of database errors. E.g., Fig. 1 shows that, for Scopus and WoS, the $\hat{p}$ values relating to Elsevier are significantly lower than those relating to several other publishers.
- Some databases are more efficient than others in identifying and correcting pre-existing errors; as a consequence, even in the presence of errors in the already published articles, they are able to index them correctly.

The present study relied on a wide set of TO citing papers; even though this set includes more than one-hundred-and-twelve thousands citing articles, the relevant cited articles are all confined within the Manufacturing field. Another limitation of this study is that the effect of publishers on omitted citations was analyzed separately with respect to other factors (such as, the amount of pre-existing errors in the TO citing articles, the relevant cited/citing article types, and the style adopted for the cited article list).

Future research is aimed at extending the study to scientific articles in other scientific disciplines, seeking practical justifications of the results obtained. The latter goal can be reached by a punctual examination of the omitted citing papers resulting from this study. In order to allow further investigation by the reader, we make available an Excel file containing the full list of the citations omitted by Scopus and WoS, depending on the publisher (see the Supplementary Material).

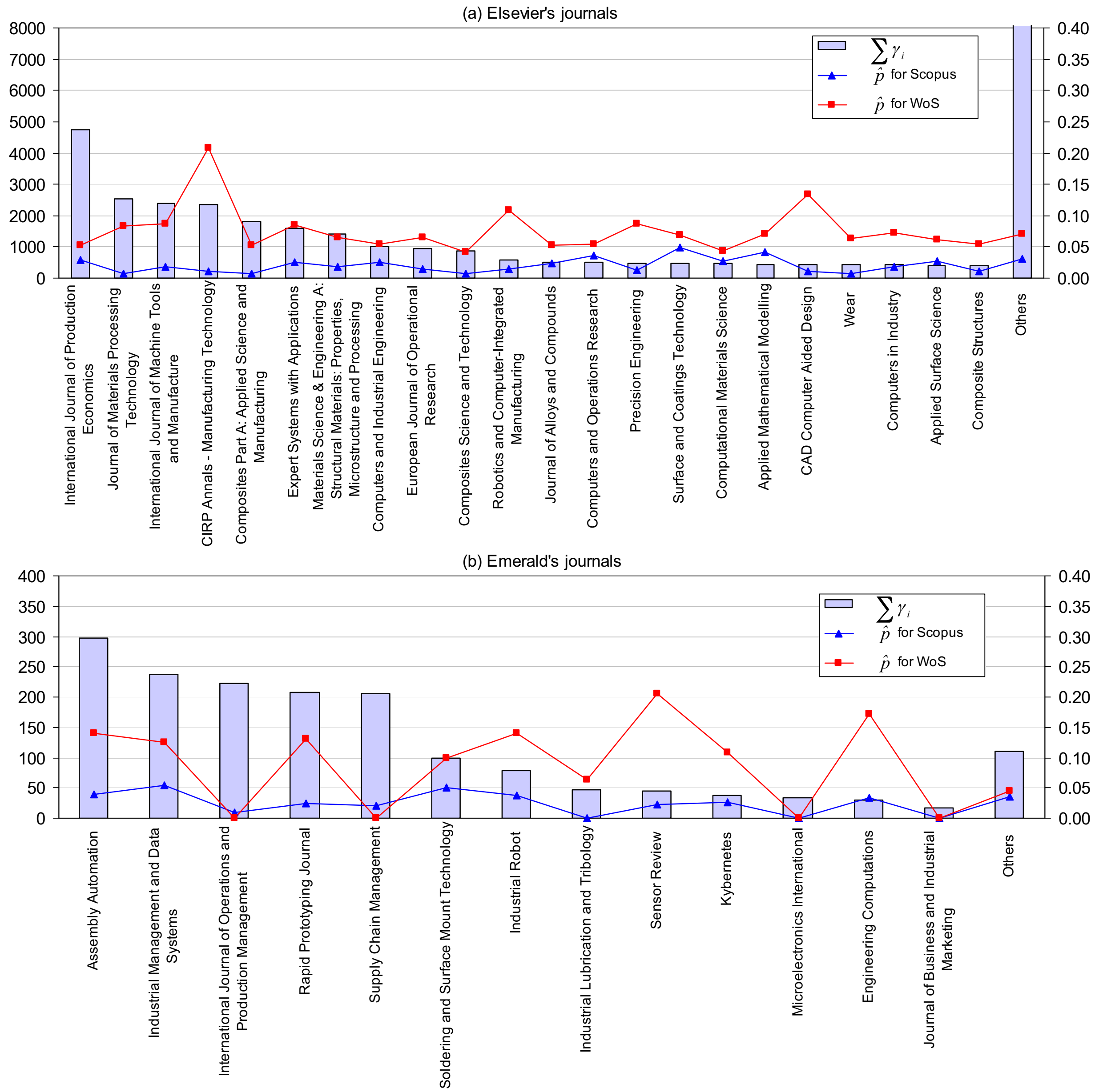

Fig. 4. Distribution of the omitted citations between journals edited by (a) Elsevier and (b) Emerald, according to both Scopus and WoS. The bar-chart (left-hand scale) shows the number of TO citations of the journals, while the line-chart (right-hand scale) shows the corresponding $\hat{p}$ values. Journals with a percentage portion of TO citing papers lower than 1% are grouped in the category “Others”. Numerical data are reported in Table A.4 (in Appendix).

Appendix A.

See the following tables and figures.

Table A.1
List of the journals examined. For each journal, it is reported the title, ISSN code and number of papers examined (P). Journals are sorted alphabetically according to their title.

Journal title	ISSN	P
AI EDAM – Artificial Intelligence for Engineering Design Analysis and Manufacturing	0890-0604	205
Assembly Automation	0144-5154	259

Table A.1 (*Continued*)

Journal title	ISSN	*P*
CIRP Annals – Manufacturing Technology	0007-8506	1050
Composites, Part A – Applied Science and Manufacturing	1359-835X	1634
Concurrent Engineering – Research and Applications	1063-293X	175
Design Studies	0142-694X	223
Flexible Services and Manufacturing Journal	1936-6582	70
Human Factors and Ergonomics in Manufacturing & Service Industries	1090-8471	239
IEEE Transaction on Components Packaging and Manufacturing Technology	2156-3950	378
IEEE Transactions on Semiconductor Manufacturing	0894-6507	453
IEEE-ASME Transactions on Mechatronics	1083-4435	645
International Journal of Advanced Manufacturing Technology	0268-3768	4273
International Journal of Computer Integrated Manufacturing	0951-192X	517
International Journal of Crashworthiness[a]	1358-8265	400
International Journal of Design[b]	1991-3761	–
International Journal of Industrial Engineering – (Theory) Applications and Practice[b]	1072-4761	–
International Journal of Machine Tools & Manufacture	0890-6955	1111
International Journal of Production Economics	0925-5273	2066
International Journal of Production Research	0020-7543	2426
Journal of Advances Mechanical Design Systems and Manufacturing	1881-3054	267
Journal of Computing and Information Science in Engineering – Transactions of the ASME	1530-9827	301
Journal of Intelligent Manufacturing	0956-5515	608
Journal of Manufacturing Science and Engineering – Transactions of the ASME	1087-1357	809
Journal of Manufacturing Systems	0278-6125	174
Journal of Materials Processing Technology	0924-0136	3978
Journal of Scheduling	1094-6136	163
Machining Science and Technology	1091-0344	202
Manufacturing Engineering[c]	0361-0853	–
Materials and Manufacturing Processes	1042-6914	1285
Proceedings of the Institution of Mechanical Engineers, Part B – Journal of Engineering Manufacture	0954-4054	1126
Packaging Technology and Science	0894-3214	264
Precision Engineering – Journal of the International Societies for Precision Engineering and Nanotechnology	0141-6359	452
Production and Operations Management	1059-1478	111
Production Planning & Control	0953-7287	460
Research in Engineering Design	0934-9839	124
Robotics and Computer-Integrated Manufacturing	0736-5845	565
Soldering & Surface Mount Technology	0954-0911	151
Total		27,164

[a] This journal is not included in the 2012 JCR, since it was banned for boosting impact factor with self-citations (Van Noorden, 2013). However, it was included in our analysis since the corresponding citation statistics were still available in WoS.
[b] These journals include articles whose DOI codes are reported by Scopus but not by WoS. For this reason, they were excluded from the analysis.
[c] This journal includes articles whose DOI codes are not reported by any of the databases in use. For this reason, it was excluded from the analysis.

Table A.2
List of the sub-publishers of the citing papers, relating to the (10) major publishers reported in Table 4. Sub-publishers are sorted decreasingly with respect to the relative portion of TO citing papers. Sub-publishers with no citing paper are not included in the list. Conventionally, it was used the (sub-)publisher classification by Scopus (Scopus Elsevier, 2014), although it is practically identical to that by WoS.

Main Publ.	Sub-publisher	Portion of TO citing papers (%)
ELS	Elsevier BV	61.99
	Pergamon Press Ltd.	30.41
	Elsevier USA	5.85
	Academic Press	1.05
	Elsevier Sequoia	0.24
	Butterworth Scientific Ltd.	0.16
	Pergamon Press	0.11
	Elsevier Masson	0.04
	W. B. Saunders Co. Ltd.	0.03
	Elsevier Science	0.03
	Mosby Inc.	0.02
	Butterworth-Heinemann	0.02
	Elsevier Applied Science	0.01
	Elsevier Science & Technology	0.01
	Hanley and Belfus Inc.	0.01
	Applied Science Publishers	0.01
	Cell Press	0.01
	Churchill Livingstone	0.01

Table A.2 (*Continued*)

Main Publ.	Sub-publisher	Portion of TO citing papers (%)
	JAI Press	0.01
	Bailliere Tindall And Cassell	≈0
	Morgan Kaufmann Publishers Inc.	≈0
SPR	Springer Verlag	71.34
	Kluwer Academic Publishers	20.85
	Springer-Verlag France	3.36
	Kluwer Academic/Plenum Publishers	2.61
	Springer Publ. Co.	1.05
	Baltzer Science Publishers B.V.	0.34
	BioMed Central	0.26
	Plenum Publishers	0.08
	Springer Publ. Co.	0.05
	Plenum Press	0.02
	Springer India	0.02
	Birkhauser Verlag	0.01
	Birkhaeuser	0.01
T&F	Taylor & Francis	67.96
	Marcel Dekker Inc.	29.41
	Routledge	1.13
	Carfax Publishing Ltd.	0.86
	Taylor and Francis	0.30
	Dekker	0.15
	Gordon and Breach Science Publishers	0.14
	Taylor & Francis CAS Journal	0.02
	Informa Healthcare	0.02
	Chapman & Hall	0.01
WIL	John Wiley & Sons Inc.	73.30
	John Wiley & Sons Ltd.	14.08
	Blackwell Publishing Inc.	8.81
	Wiley-VCH Verlag GmbH & Co.	3.13
	Wiley-Blackwell	0.38
	Wiley-VCH Verlag GmbH & Co. KGaA	0.16
	Wiley-Liss Inc.	0.11
	Munksgaard International Publishers	0.03
IEEE	Institute of Electrical and Electronics Engineers	99.00
	Institute of Electrical and Electronics Engineers	0.47
	IEEE Education Society	0.39
	IEEE Computer Society	0.14
PEP	Professional Engineering Publishing Ltd.	100.00
ASME	ASME	54.24
	ASM International	30.92
	American Society of Mechanical Engineers	14.84
SAGE	Sage Publications	95.91
	Sage Science Press	4.04
	Sage Publications India Pvt. Ltd.	0.05
TTP	Trans Tech Publications Ltd.	100.00
EME	Emerald Group Publishing Ltd.	100.00

Table A.3
Main results of the analysis at annual level. Citing and cited articles were issued from 2006 to 2012 and citations were accumulated in the same period. Statistics are determined both for Scopus and WoS.

Publ.	Year	$\sum_{i=1}^{P}\gamma_i$	(a) Scopus		(b) Wos	
			$\sum_{i=1}^{P}\omega_i$	$\hat{p}$ (%)	$\sum_{i=1}^{P}\omega_i$	$\hat{p}$ (%)
ELS	2006	105	8	7.6	23	21.9
	2007	868	31	3.6	137	15.8
	2008	2860	58	2.0	298	10.4
	2009	5563	150	2.7	478	8.6
	2010	7343	203	2.8	599	8.2

Table A.3 (*Continued*)

Publ.	Year	$\sum_{i=1}^{P}\gamma_i$	(a) Scopus		(b) Wos	
			$\sum_{i=1}^{P}\omega_i$	$\hat{p}$ (%)	$\sum_{i=1}^{P}\omega_i$	$\hat{p}$ (%)
	2011	10,204	203	2.0	711	7.0
	2012	12,947	297	2.3	821	6.3
	Total	39,890	950	2.4	3067	7.7
SPR	2006	20	1	5.0	4	20.0
	2007	109	8	7.3	14	12.8
	2008	598	27	4.5	57	9.5
	2009	1946	125	6.4	163	8.4
	2010	2849	143	5.0	202	7.1
	2011	3371	109	3.2	256	7.6
	2012	4724	194	4.1	317	6.7
	Total	13,617	607	4.5	1013	7.4
T&F	2006	16	3	18.8	5	31.3
	2007	172	8	4.7	23	13.4
	2008	517	24	4.6	57	11.0
	2009	1237	92	7.4	113	9.1
	2010	2172	80	3.7	160	7.4
	2011	3172	84	2.6	242	7.6
	2012	4795	130	2.7	315	6.6
	Total	12,081	421	3.5	915	7.6
WIL	2006	16	1	6.3	2	12.5
	2007	107	19	17.8	10	9.3
	2008	298	75	25.2	20	6.7
	2009	499	115	23.0	28	5.6
	2010	698	143	20.5	35	5.0
	2011	919	132	14.4	51	5.5
	2012	1107	238	21.5	37	3.3
	Total	3644	723	19.8	183	5.0
IEEE	2006	15	2	13.3	2	13.3
	2007	68	5	7.4	8	11.8
	2008	215	14	6.5	13	6.0
	2009	478	24	5.0	51	10.7
	2010	714	24	3.4	46	6.4
	2011	935	37	4.0	69	7.4
	2012	1174	32	2.7	88	7.5
	Total	3599	138	3.8	277	7.7
PEP	2006	26	4	15.4	6	23.1
	2007	86	4	4.7	18	20.9
	2008	234	23	9.8	29	12.4
	2009	386	47	12.2	27	7.0
	2010	545	62	11.4	59	10.8
	2011	845	7	0.8	53	6.3
	2012	1012	34	3.4	64	6.3
	Total	3134	181	5.8	256	8.2
ASME	2006	5	0	0.0	1	20.0
	2007	86	9	10.5	23	26.7
	2008	222	12	5.4	28	12.6
	2009	334	10	3.0	40	12.0
	2010	651	18	2.8	56	8.6
	2011	813	28	3.4	77	9.5
	2012	874	39	4.5	113	12.9
	Total	2985	116	3.9	338	11.3
SAGE	2006	2	1	50.0	0	0.0
	2007	37	2	5.4	6	16.2
	2008	132	2	1.5	11	8.3
	2009	242	1	0.4	25	10.3
	2010	419	14	3.3	24	5.7
	2011	551	43	7.8	32	5.8
	2012	695	8	1.2	44	6.3
	Total	2078	71	3.4	142	6.8

Table A.3 (*Continued*)

Publ.	Year	$\sum_{i=1}^{P}\gamma_i$	(a) Scopus		(b) Wos	
			$\sum_{i=1}^{P}\omega_i$	$\hat{p}$ (%)	$\sum_{i=1}^{P}\omega_i$	$\hat{p}$ (%)
TTP	2006	0	0	NaN	0	NaN
	2007	0	0	NaN	0	NaN
	2008	0	0	NaN	0	NaN
	2009	4	0	0.0	0	0.0
	2010	419	17	4.1	0	0.0
	2011	531	16	3.0	0	0.0
	2012	762	16	2.1	0	0.0
	Total	1716	49	2.9	0	0.0
EME	2006	9	0	0.0	2	22.2
	2007	46	2	4.3	7	15.2
	2008	102	2	2.0	9	8.8
	2009	222	20	9.0	21	9.5
	2010	280	7	2.5	36	12.9
	2011	410	11	2.7	42	10.2
	2012	596	9	1.5	29	4.9
	Total	1665	51	3.1	146	8.8

$\sum\gamma_i$ is the total number of TO citations.
$\sum\omega_i$ is the total number of omitted citations, according to a database.
$\hat{p}$ is the omitted-citation rate, according to a publisher.
The 95% *CI* around $\hat{p}$ is obtained applying the approximated relationship in Eq. (2).

Table A.4
List of the (citing) journals relating to the (ten) major publishers reported in Table4. Journals are sorted decreasingly with respect to the number of TO citing articles analyzed. Journals with no TO citing papers are not included in the list, while journals with a percentage portion of papers lower than 1% are grouped in the category "Others". These journals are covered by both the Scopus and WoS databases.

Publ.	Journal	$\sum_{i=1}^{P}\gamma_i$	Portion of TO citing papers (%)	(a) Scopus		(b) Wos	
				$\sum_{i=1}^{P}\omega_i$	$\hat{p}$ (%)	$\sum_{i=1}^{P}\omega_i$	$\hat{p}$ (%)
ELS	International Journal of Production Economics	4759	11.9	142	3.0	250	5.3
	Journal of Materials Processing Technology	2521	6.3	20	0.8	210	8.3
	International Journal of Machine Tools and Manufacture	2401	6.0	44	1.8	208	8.7
	CIRP Annals – Manufacturing Technology	2335	5.9	26	1.1	485	20.8
	Composites Part A: Applied Science and Manufacturing	1805	4.5	12	0.7	96	5.3
	Expert Systems with Applications	1581	4.0	40	2.5	135	8.5
	Materials Science & Engineering A: Structural Materials: Properties, Microstructure and Processing	1421	3.6	27	1.9	92	6.5
	Computers and Industrial Engineering	1006	2.5	25	2.5	54	5.4
	European Journal of Operational Research	932	2.3	13	1.4	60	6.4
	Composites Science and Technology	871	2.2	7	0.8	36	4.1
	Robotics and Computer–Integrated Manufacturing	589	1.5	8	1.4	64	10.9
	Journal of Alloys and Compounds	520	1.3	12	2.3	27	5.2
	Computers and Operations Research	501	1.3	18	3.6	27	5.4
	Precision Engineering	481	1.2	6	1.2	42	8.7
	Surface and Coatings Technology	471	1.2	23	4.9	32	6.8
	Computational Materials Science	468	1.2	13	2.8	20	4.3
	Applied Mathematical Modelling	442	1.1	18	4.1	31	7.0
	CAD Computer Aided Design	432	1.1	5	1.2	58	13.4
	Wear	430	1.1	3	0.7	27	6.3
	Computers in Industry	424	1.1	8	1.9	31	7.3
	Applied Surface Science	411	1.0	11	2.7	25	6.1
	Composite Structures	391	1.0	4	1.0	21	5.4
	Others	14,698	36.7	465	3.2	1036	7.0

Table A.4 (*Continued*)

Publ.	Journal	$\sum_{i=1}^{P} \gamma_i$	Portion of TO citing papers (%)	(a) Scopus		(b) Wos	
				$\sum_{i=1}^{P} \omega_i$	$\hat{p}$ (%)	$\sum_{i=1}^{P} \omega_i$	$\hat{p}$ (%)
SPR	International Journal of Advanced Manufacturing Technology	8508	62.5	306	3.6	718	8.4
	Journal of Intelligent Manufacturing	1050	7.7	51	4.9	74	7.0
	Journal of Materials Science	575	4.2	47	8.2	27	4.7
	International Journal of Material Forming	457	3.4	25	5.5	0	0.0
	Research in Engineering Design – Theory, Applications, and Concurrent Engineering	162	1.2	4	2.5	10	6.2
	Others	2865	21.0	174	6.1	184	6.4
T&F	International Journal of Production Research	4748	39.3	200	4.2	328	6.9
	Materials and Manufacturing Processes	2658	22.0	34	1.3	213	8.0
	International Journal of Computer Integrated Manufacturing	1199	9.9	33	2.8	132	11.0
	Production Planning and Control	554	4.6	12	2.2	33	6.0
	Machining Science and Technology	428	3.5	10	2.3	51	11.9
	Journal of Engineering Design	239	2.0	14	5.9	21	8.8
	Polymer – Plastics Technology and Engineering	201	1.7	5	2.5	20	10.0
	International Journal of Systems Science	176	1.5	1	0.6	5	2.8
	IIE Transactions (Institute of Industrial Engineers)	168	1.4	5	3.0	14	8.3
	Others	1710	14.1	107	6.3	98	5.7
WIL	Journal of Applied Polymer Science	830	22.8	367	44.2	21	2.5
	Polymer Composites	402	11.0	163	40.5	3	0.7
	Packaging Technology and Science	300	8.2	6	2.0	32	10.7
	Polymer Engineering and Science	179	4.9	49	27.4	5	2.8
	Quality and Reliability Engineering International	172	4.7	7	4.1	8	4.7
	Materialwissenschaft und Werkstofftechnik	113	3.1	3	2.7	14	12.4
	Advanced Engineering Materials	108	3.0	8	7.4	3	2.8
	Human Factors and Ergonomics In Manufacturing	101	2.8	11	10.9	2	2.0
	Polymers for Advanced Technologies	88	2.4	0	0.0	4	4.5
	Macromolecular Materials and Engineering	88	2.4	3	3.4	3	3.4
	Polymer International	62	1.7	2	3.2	3	4.8
	Journal of Polymer Science, Part B: Polymer Physics	51	1.4	10	19.6	2	3.9
	Strain	46	1.3	0	0.0	3	6.5
	Advanced Functional Materials	40	1.1	2	5.0	2	5.0
	Journal of Vinyl and Additive Technology	36	1.0	10	27.8	3	8.3
	International Journal for Numerical Methods in Engineering	35	1.0	0	0.0	1	2.9
	Others	993	27.2	82	8.3	74	7.5
IEEE	IEEE/ASME Transactions on Mechatronics	1297	36.0	20	1.5	106	8.2
	IEEE Transactions on Semiconductor Manufacturing	329	9.1	16	4.9	15	4.6
	IEEE Transactions on Automation Science and Engineering	229	6.4	4	1.7	22	9.6
	IEEE Transactions on Industrial Electronics	166	4.6	5	3.0	17	10.2
	IEEE Transactions on Systems, Man and Cybernetics Part A: Systems and Humans.	129	3.6	2	1.6	7	5.4
	IEEE Transactions on Engineering Management	97	2.7	1	1.0	3	3.1
	IEEE Transactions on Systems, Man and Cybernetics Part C: Applications and Reviews	95	2.6	14	14.7	4	4.2
	IEEE Transactions on Robotics	92	2.6	1	1.1	6	6.5
	IEEE Transactions on Industrial Informatics	90	2.5	3	3.3	13	14.4
	IEEE Transactions on Control Systems Technology	88	2.4	0	0.0	9	10.2
	IEEE Transactions on Magnetics	73	2.0	2	2.7	6	8.2
	IEEE Transactions on Instrumentation and Measurement	55	1.5	1	1.8	3	5.5
	Proceedings – IEEE International Conference on Robotics and Automation	43	1.2	0	0.0	0	0.0

Table A.4 (*Continued*)

Publ.	Journal	$\sum_{i=1}^{P}\gamma_i$	Portion of TO citing papers (%)	(a) Scopus		(b) Wos	
				$\sum_{i=1}^{P}\omega_i$	$\hat{p}$ (%)	$\sum_{i=1}^{P}\omega_i$	$\hat{p}$ (%)
	IEEE Transactions on Biomedical Engineering	38	1.1	1	2.6	4	10.5
	Journal of Electronic Materials	37	1.0	7	18.9	1	2.7
	IEEE Sensors Journal	37	1.0	4	10.8	6	16.2
	IEEE Transactions on Reliability	36	1.0	0	0.0	6	16.7
	Journal of Microelectromechanical Systems	35	1.0	2	5.7	4	11.4
	Others	633	17.7	55	8.7	45	7.1
PEP	Proceedings of the Institution of Mechanical Engineers, Part B: Journal of Engineering Manufacture	2373	75.7	145	6.1	193	8.1
	Proceedings of the Institution of Mechanical Engineers, Part C: Journal of Mechanical Engineering Science	327	10.4	12	3.7	27	8.3
	Proceedings of the Institution of Mechanical Engineers, Part J: Journal of Engineering Tribology	91	2.9	6	6.6	15	16.5
	Journal of Strain Analysis for Engineering Design	89	2.8	2	2.2	0	0.0
	Proceedings of the Institution of Mechanical Engineers, Part L: Journal of Materials: Design and Applications	71	2.3	4	5.6	8	11.3
	Proceedings of the Institution of Mechanical Engineers. Part I: Journal of Systems and Control Engineering	69	2.2	7	10.1	3	4.3
	Proceedings of the Institution of Mechanical Engineers, Part H: Journal of Engineering in Medicine	41	1.3	3	7.3	7	17.1
	Proceedings of the Institution of Mechanical Engineers, Part E: Journal of Process Mechanical Engineering	33	1.1	0	0.0	2	6.1
	Others	40	1.3	2	5.0	1	2.5
ASME	Journal of Manufacturing Science and Engineering, Transactions of the ASME	1084	36.3	51	4.7	155	14.3
	Journal of Materials Engineering and Performance	463	15.5	13	2.8	54	11.7
	Journal of Mechanical Design – Transactions of the ASME	299	10.0	13	4.3	36	12.0
	Metallurgical and Materials Transactions A: Physical Metallurgy and Materials Science	298	10.0	3	1.0	21	7.0
	Journal of Computing and Information Science in Engineering	240	8.0	8	3.3	27	11.3
	Journal of Engineering Materials and Technology, Transactions of the ASME	119	4.0	5	4.2	15	12.6
	Journal of Thermal Spray Technology	88	2.9	1	1.1	7	8.0
	Metallurgical and Materials Transactions B: Process Metallurgy and Materials Processing Science	71	2.4	9	12.7	4	5.6
	Journal of Dynamic Systems, Measurement and Control, Transactions of the ASME	61	2.0	1	1.6	0	0.0
	Journal of Mechanisms and Robotics	53	1.8	1	1.9	0	0.0
	Journal of Tribology	45	1.5	0	0.0	4	8.9
	Others	164	5.6	36	22.0	15	9.1
SAGE	Journal of Composite Materials	658	31.7	18	2.7	33	5.0
	Journal of Reinforced Plastics and Composites	478	23.0	31	6.5	26	5.4
	Concurrent Engineering Research and Applications	215	10.3	5	2.3	25	11.6
	Textile Research Journal	103	5.0	4	3.9	10	9.7
	Journal of Thermoplastic Composite Materials	100	4.8	0	0.0	5	5.0
	Experimental Mechanics	84	4.0	1	1.2	2	2.4
	Journal of Intelligent Material Systems and Structures	70	3.4	0	0.0	10	14.3
	Simulation	44	2.1	0	0.0	4	9.1

Table A.4 (*Continued*)

Publ.	Journal	$\sum_{i=1}^{P}\gamma_i$	Portion of TO citing papers (%)	(a) Scopus		(b) Wos	
				$\sum_{i=1}^{P}\omega_i$	$\hat{p}$ (%)	$\sum_{i=1}^{P}\omega_i$	$\hat{p}$ (%)
	International Journal of Robotics Research	40	1.9	0	0.0	5	12.5
	JVC/Journal of Vibration and Control	39	1.9	6	15.4	6	15.4
	Transactions of the Institute of Measurement and Control	32	1.5	0	0.0	3	9.4
	Journal of Sandwich Structures and Materials	31	1.5	0	0.0	1	3.2
	International Journal of Damage Mechanics	27	1.3	0	0.0	3	11.1
	Others	157	7.6	6	3.8	9	5.7
TTP	Key Engineering Materials	1129	65.8	20	1.8	0	0
	Materials Science Forum	581	33.9	29	5.0	0	0
	Others	6	0.3	0	0.0	0	0
EME	Assembly Automation	297	17.8	12	4.0	42	14.1
	Industrial Management and Data Systems	238	14.3	13	5.5	30	12.6
	International Journal of Operations and Production Management	222	13.3	2	0.9	0	0.0
	Rapid Prototyping Journal	208	12.5	5	2.4	27	13.0
	Supply Chain Management	205	12.3	4	2.0	0	0.0
	Soldering and Surface Mount Technology	100	6.0	5	5.0	10	10.0
	Industrial Robot	78	4.7	3	3.8	11	14.1
	Industrial Lubrication and Tribology	47	2.8	0	0.0	3	6.4
	Sensor Review	44	2.6	1	2.3	9	20.5
	Kybernetes	37	2.2	1	2.7	4	10.8
	Microelectronics International	33	2.0	0	0.0	0	0.0
	Engineering Computations	29	1.7	1	3.4	5	17.2
	Journal of Business and Industrial Marketing	17	1.0	0	0.0	0	0.0
	Others	110	6.8	4	3.6	5	4.5

Appendix B. Supplementary data

Supplementary data associated with this article can be found, in the online version, at http://dx.doi.org/10.1016/j.joi.2014.07.003.

References

Adam, D. (2002). Citation analysis: The counting house. *Nature*, *415*(6873), 726–729.

Buchanan, R. A. (2006). Accuracy of cited references: The role of citation databases. *College and Research Libraries*, *67*(4), 292–303.

Franceschini, F., & Maisano, D. (2011a). Influence of database mistakes on journal citation analysis: Remarks on the paper by Franceschini and Maisano, QREI (2010). *Quality and Reliability Engineering International*, *27*(7), 969–976.

Franceschini, F., & Maisano, D. (2011b). Structured evaluation of the scientific output of academic research groups by recent *h*-based indicators. *Journal of Informetrics*, *5*(1), 64–74.

Franceschini, F., Maisano, D., & Mastrogiacomo, L. (2013). A novel approach for estimating the omitted-citation rate of bibliometric databases. *Journal of the American Society for Information Science and Technology*, *64*(10), 2149–2156.

Franceschini, F., Maisano, D., & Mastrogiacomo, L. (2014). Influence of omitted citations on the bibliometric statistics of the major manufacturing journals. *International Journal of Production Economics*,. Available at: http://staff.polito.it/fiorenzo.franceschini/Pubblicazioni/Revised_IJPE-D-13-01272.pdf

ISO 4:1997. (1997). *Information and documentation – Rules for the abbreviation of title words and titles of publications*. Geneva, Switzerland: International Organization for Standardization.

Jacsó, P. (2006). Deflated, inflated and phantom citation counts. *Online Information Review*, *30*(3), 297–309.

Jacsó, P. (2012). Grim tales about the impact factor and the *h*-index in the Web of Science and the Journal Citation Reports databases: Reflections on Vanclay's criticism. *Scientometrics*, *92*(2), 325–354.

Labbé, C. (2010). Ike Antkare, one of the great stars in the scientific firmament. *ISSI Newsletter*, *6*(2), 48–52.

Li, J., Burnham, J. F., Lemley, T., & Britton, R. M. (2010). Citation analysis: Comparison of Web of Science, Scopus, Scifinder, and Google Scholar. *Journal of Electronic Resources in Medical Libraries*, *7*(3), 196–217.

Montgomery, D. C. (2005). *Introduction to statistical quality control* (5th ed.). New York: Wiley.

Olensky, M. (2013). Accuracy assessment for bibliographic data. In *Proceedings of the 13th international conference of the international society for scientometrics and informetrics (ISSI), Vol. 2* Vienna, Austria, (pp. 1850–1851).

Schenker, N., & Gentleman, J. F. (2001). On judging the significance of differences by examining the overlap between confidence intervals. *American Statistician*, *55*(3), 182–186.

Scopus Elsevier. (2014). *Scopus content coverage*. Available at: http://www.scopus.com (20.06.13)

Thomson Reuters. (2014a). *ISI journal title abbreviations index*. http://images.webofknowledge.com/WOK46/help/WOS/A_abrvjt.html (20.04.14)

Thomson Reuters. (2014b). *Master journal list*. http://ip-science.thomsonreuters.com/mjl/ (20.04.14)

Van Noorden, R. (2013). New record: 66 journals banned for boosting impact factor with self-citations. *Nature News Blog*,. http://blogs.nature.com/news/2013/06/new-record-66-journals-banned-for-boosting-impact-factor-with-self-citations.html (20.04.14)