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Journal Impact Factor: A valid symbol of journal quality?

Abstract

As the citation frequency of a journal is a representation of how many people have read and acknowledged their works, academia generally shares the notion that impact factor and citation data signify the quality and importance of a journal to the discipline. Although this notion is well entrenched, is it reasonable to deduce that a journal is not of good quality due to its lower impact factor? Do journal impact factors truly symbolise the quality of a journal? What must be noted when we interpret journal impact factors? This commentary article discusses these questions and their answers thoroughly.

Keywords: Citations; journal impact factor; journal quality.

1. Introduction

In Summer 2018, Thomson Reuters published its annual *Journal Citation Report* and announced the impact factor figures of all Science Citation Index and Social Science Citation Index listed journals in the year 2017. Among the 50 journals in the category 'Hospitality, Leisure, Sport & Tourism' (see Appendix I), four journals received over 5,000 citations in 2017 and two received over 10,000 citations in 2017. *Tourism Management* and *Journal of Travel Research* occupied the first two places with journal impact factors of 5.921 and 5.169, respectively. Being one of the most influential tourism journals known and highly rated by academics in the field (Gursoy and Sandstrom, 2016; McKercher, Law and Lam, 2006), the journal impact factor value of *Tourism Economics* improved from 0.392 in 2015 to 0.942 in 2017. The journal published 172 citable articles in 2015 and 2016, and they received a total of 162 citations in 2017 (Clarivate, 2019b).

Regarding the journal impact factor figures, the quality of *Tourism Economics* may naturally be assumed as less satisfactory than other journals in the same category. As citing articles from a given journal is equivalent to casting useful votes for that journal, academia may share the notion that impact factor and citation data signify the quality and importance of a journal to its

corresponding discipline. Without a doubt, the journal impact factor does offer a conventional and transparent way to compare and communicate 'journal quality' (Thomson Reuters, 201l; cited in Vanclay, 2012). Yet, many researchers opine that journal impact factor is not a valid surrogate of journal quality because the quality of scientific journals is associated with multiple features such as originality, validity and others (e.g. Brumback, 2008; Lluch, 2005; Rossner, Van Epps and Hill, 2007). Some researchers also underscore that a poor correlation exists between journal impact factor and journal prestige as ranked by academics in their corresponding disciplines (e.g. Brody and Foster, 1995; Saha, Saint and Christakis, 2003).

Is it reasonable to deduce that a journal is not of good quality due to its lower impact factor? Do journal impact factors truly symbolise the quality of a journal? What must be noted when we interpret journal impact factors? This commentary article discusses these questions and their answers thoroughly.

2. Why does Journal Impact Factor Matter?

Conceptually developed by Eugene Garfield in the 1950s, Thomson Reuters' journal impact factor has long been recognised as a putative measure to evaluate the quality of a journal based upon the citations received from its published works (Garfield, 1999; 2003).

Law (2012) notes that the increasing attention to journal impact factors is partially attributed to the intense competition induced by the increasing number of academic journals. Indeed, as a representation of the frequency with which the average article in a journal has been cited in a particular year, Glanzel and Moed (2002) observe that the impact factor of a journal signifies its perceived prestige in the academic community because citation frequency reflects a journal's importance to academic researchers – the primary end users of journals. Law, Ye, Chen and Leung (2009) claim that the impact factor and citation frequency of a journal indicate its level of influence on the scientific community and even knowledge curation. This contention is founded on the assumption that publications should be created to make research findings acknowledged by other researchers via citations, thereby inspiring academics to create more research endeavours. Given that the citation frequency of a journal is a representation of how many people read and acknowledge their works, many researchers posit that the journal impact factor can serve as a

reasonable indicator of journal quality (Saha, Saint and Christakis, 2003) as well as a valid measure of a journal's impact on the scientific community (Garfield, 2003).

The significant practical implications of journal impact factors might also explain why scholarly attention towards journal impact factors remains continuously high. Given its diagnostic ability, the journal impact factor is frequently used by librarians to guide the purchase of articles or journals for library collections (Buela-Casal and Zych, 2012). Publishers actively use the journal impact factors for marketing decisions (Alberts, 2008; Hall and Page, 2015). Due to the commercialisation of academic publishing and the development of research assessment exercises at the governmental and institutional level (Hall, 2011; Willinsky and Wolfson, 2011), several researchers even claim that journal impact factors are now used by institutions to determine individual researchers' recruitment, promotion and funding allocation (e.g. Hall and Page, 2015; Lowy, 1997; Smeyers and Burbules, 2011; Tobin, 2004). Adam (2002) states that a paper published in a journal with an impact factor of 3 rather than 2 can help boost the funding of an institute by USD7,000 in 2000.

3. What Makes Journal Impact Factor an Unreliable Proxy of Journal Quality?

Apparently, the advent of journal impact factor provides an easily accessible metric to critically evaluate the world's leading journals because most publishing and citation data are electronically available (Archambault and Larivière, 2009; Garfield, 2003; Owlia, Vasei, Goliaei and Nassiri, 2011; Vanclay, 2012). Despite this technical merit, many researchers assert that the notion of using impact factor as the proxy of journal quality is subject to some validity concerns (e.g. Moed and Van Leeuwen, 1996; Rossner, Van Epps and Hill, 2007; Seglen, 1997). Some researchers (e.g. Buela-Casal and Zych, 2012) even argue that renaming this metric is highly essential because the figure does not signify the impact or/and quality of an academic journal.

Generally speaking, four main reasons explain why the computed score of journal impact factor cannot be claimed as a reliable representation of journal quality.

3.1. Flawed computation method

The method used to calculate the journal impact factor value is inherently problematic, as demonstrated in studies by Glanzel and Moed (2002) as well as Togia and Tsigilis (2006). According to Garfield (1999), the numerator of one journal's impact factor is the number of citations received in the current year for all 'published articles' in the journal in the preceding two years. As the citations for all types of 'published articles' are included, according to Table 1, the numerators of both Journal A's and Journal B's impact factors in 2017 are 300. The denominator of one journal's impact factor is the number of 'citable articles' published in the same two years, as Garfield (2003) notes. Garfield (2006, p. 91) later states that '*correspondence, letters, commentaries, perspectives, news stories, obituaries, editorials, interviews, and tributes are not included in the Journal Citation Report's denominator*', the denominators of the impact factors of Journal A and Journal B are 45 and 34, respectively.

*** Please insert Table 1 here ***

As illustrated in this demonstration, even though certain types of articles like editorials and commentaries are not classified as 'citable' articles, the citations for such articles are still counted when impact factor is computed. Given that journals can increase the number of 'non-citable articles' to artificially attract more citations, this flawed computation method would distort the 'real impact' of those citable articles and inflate the impact of the journal (Gowrishankar and Divakar, 1999).

3.2. Mysterious representativeness

Although the formula introduced by Thomson Reuters to compute a journal's impact factor is publicly available, the criteria that Thomson Reuters uses to determine whether a journal is included or not is not disclosed to the public. Togia and Tsigillis (2006) report that education journals included in the *Journal Citation Report* only represent approximately 11% of all refereed journals in the education field. Serenko (2010) also criticises the fact that Thomson Reuters' *Journal Citation Report* mainly covers a few refereed journals. English-language journals seem to be favoured by Thomson Reuters while publications in other languages (e.g. Spanish, Chinese and

German) are underrepresented (Dong, Loh and Mondry, 2005; Seglen, 1997). Publications in other forms, such as conference articles and dissertations, are excluded from analysis; thus, many researchers do not consider journal impact factor as a representative surrogate of journal quality from the global readers' perspective (e.g. Saha, Saint and Christakis, 2003; Serenko, 2010).

In addition to the mysterious journal inclusion criteria, the criteria that Thomson Reuters used to define whether articles are citable are not known to the public (Glanzel and Moed, 2002; Moed and Van Leeuwen, 1996). Rossner, Van Epps and Hill (2007) once attempted to solicit data used to reproduce the impact factor, but Thompson Reuters rejected their request. Several researchers (e.g. Brumback, 2008) tried but failed to replicate the impact factor using publicly available data. By comparing the computed number of citable articles (from *Journal Citation Report* figures) and the counted number of citable articles (according to data available on the journal websites), Law and Li (2015) report similar findings in their recent work. As Thomson Reuters determines whether articles are citable or not in the black box, the low transparency of its computation method makes journal impact factors unreliable.

3.3. ~~High manipulativeness~~ Low diagnosticability

~~High level of manipulativeness~~ Low level of diagnosticability also justifies why the journal impact factor is not a reliable measure of journal quality. Seglen (1997) notes that journal impact factor is not a good proxy because citations are generally non-parametric and few articles may attract the majority of citations. Indeed, as illustrated in Table 2, although the impact factors of Journals A and B are identical, the overall quality of Journal A is deemed to be higher because all its published articles receive citations while only one-fourth of the published articles from Journal B receive citations. Considering that the ratio of cited articles over citable articles is disregarded when journal impact factors are computed, ~~journal editors could manipulate journal impact factors using different approaches. For instance, editors can publish more long articles rather than short ones in their journals.~~ the impact factor may not be able to reflect the 'real impact' of a journal because the value does not unveil whether the citations received come from all citable articles or a few citable articles only.

*** Please insert Table 2 here ***

Besides disregarding the ratio of cited articles over citable articles, the journal impact factor is found to be unable to control the impact brought by other extraneous factors such as article length and article type. As the length (i.e. word count) of those citable articles is not taken into account when impact factors are assessed and because the citation rate of an article is proportional to its length, ~~journal editors can manipulate a~~ journal's impact factor may be inflated because it publishes a larger number of long rather than short articles in the preceding two years. The inclusion of more review articles may also inflate a journal's impact factor. Hecht, Hecht and Sandberg (1998) report that 60% of the 25 highest impact factor ranked journals publish primarily review articles. As noted by Selgen (1997) as well as Weale, Bailey and Lear (2004), review articles generally receive more citations. Although review articles are popular among readers in general and researchers in particular, their original or theoretical contributions are comparatively limited. Hence, the inclusion of more review articles may only increase a journal's impact factor but not its overall quality.

~~Publishing articles with methodological faults is another feasible albeit unusual approach that editors can embrace with the purpose of intentionally attracting many citations. According to Scully and Lodge (2005), a journal's impact factor does not reflect whether an article is cited because it contains valuable information or is an example of bad science. Given that numerous researchers cite an article because they criticise the mistakes existing in that work, a journal with more 'negative citations' can only reflect its popularity among readers but not its quality.~~

3.4. Ignorance of disciplinary, topical and geographical foci

Thomson Reuters' decision to choose two-year citation period tends to favour journals in rapidly developing fields with short publication lags (e.g. biology and chemistry) over slowly developing fields (e.g. social sciences and management) (Amin and Mabe, 2000; Seglen, 1997). According to Garfield (2003), the two-year citation period was chosen because citations in the fields that were of interest to the readers of Science Citation Index were accounted for mostly in the year of publication plus the two previous years. Given that the life cycles of data in pure science

disciplines are shorter and their published reports become obsolete rapidly, Nicolaisen and Frandsen (2008) claim that journals in pure sciences often receive more citations within the first two years after the research articles are published. Conversely, because the life cycles of data and knowledge from social science disciplines are longer, journals in the social science fields may not receive citations in the early phase.

Manske (2004) underscores that journals can only be compared if they belong to the same scientific field. Seglen (1997) also stresses that comparing impact factors among journals across various disciplines is meaningless conceptually because the average number of references per article varies from field to field. Unless the data are normalised and various parameters that affect impact are considered, researchers (e.g. Garfield, 2003; Owlia, Vasei, Goliaei and Nassiri, 2011) generally agree that using impact factors to compare journals across various disciplines is not sensible.

In addition to considering the disciplines affiliated with the journal, Manske (2004) underscores that journals can only be compared if they target the same segment of readers. Like other disciplines, the tourism and hospitality field has generic journals (e.g. *Tourism Management* and *Journal of Travel Research*) that accommodate articles on all issues on the planning and management of travel and tourism. Speciality journals with idiosyncratic topical foci (e.g. *Tourism Economics* and *Tourism Geographies*) or/and geographical foci (e.g. *Asia Pacific Journal of Tourism Research* and *Scandinavian Journal of Hospitality and Tourism*) are also available. As speciality journals potentially target a smaller group of audiences with niche interest while generic journals generally have a large audience, comparing journals with different natures by using the same standard is similar to evaluating the quality of an apple by using the assessment criteria for orange (see Table 3). Since generic journals that cover a wider range of subjects are logically more likely to be cited than specialised journals with a much narrower focus and target audience (Ganzel and Moed, 2002; Hall and Page, 2015; Yu, Shen, Pan and Wu, 2009), ignorance of the journals' topical and geographical foci is deemed to be worse than useless because it is completely misleading.

*** Please insert Table 3 here ***

4. Conclusions

Because of some limitations in the computation method, the computed score of journal impact factor can hardly be claimed as the sole reliable representation of journal quality. Jarwal, Brion and King (2009) empirically prove that bibliometric metrics in general and journal impact factors, in particular, are not robust instruments for assessing research quality. Lluch (2005) also stresses that the quality of scientific journals is a multi-faceted concept that should not be determined based on bibliometric indicators alone. Journal quality is much more associated with features like originality, validity and others, and using only impact factor to determine journal quality is clearly insufficient.

In line with the notion shared by Law and Li (2015) in their concluding remarks, the authors of this work would like to suggest that academic researchers forgo impact factor values as the one and only means of judging a journal's quality. Impact factors can be regarded as a reference, but it should not be the sole criterion for assessing journal quality. Elliott's (2014) editorial note indicates that paper acceptance rate and the number of downloads that papers within the journal receive should be considered when journal quality is assessed. Similarly, Weale, Bailey and Lear (2004) also suggest that the ratio of articles with citation(s) to articles without citation(s) should be considered when the quality of a journal is assessed. While peer evaluation is generally costly, Garfield (2003) notes that informed peer evaluation should be incorporated when evaluating the quality of all journals in a field. Combining citation analysis with the thoughts (e.g. rating or ranking) shared by researchers and practitioners in the corresponding field can reflect comprehensively the overall importance of journals to the field.

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Appendix I. Impact factors of tourism and hospitality journals in the year 2017

Rank	Journal title	JIF	Citations	Articles
1	*Tourism Management*	5.921	17,967	3,034
2	*Journal of Travel Research*	5.169	7,446	1,441
3	*Annals of Tourism Research*	5.086	11,731	2,307
4	*Journal of Destination Marketing & Management*	3.667	551	150
6	*Current Issues in Tourism*	3.462	2,330	673
7	*International Journal of Hospitality Management*	3.445	6,190	1,797
8	*Journal of Sustainable Tourism*	3.329	4,009	1,204
10	*International Journal of Contemporary Hospitality Management*	2.874	3,485	1,213
12	*Journal of Hospitality & Tourism Research*	2.685	1,548	577
13	*Journal of Hospitality Marketing & Management*	2.683	969	361
15	*International Journal of Tourism Research*	2.449	2,425	990
21	*Journal of Vacation Marketing*	2.170	1,308	603
24	*Tourism Geographies*	2.068	1,412	683
25	*Cornell Hospitality Quarterly*	2.060	1,158	562
26	*Journal of Travel & Tourism Marketing*	1.975	2,460	1,246
29	*Tourism Management Perspectives*	1.779	794	446
32	*Tourist Studies*	1.537	601	391
34	*Asia Pacific Journal of Tourism Research*	1.352	919	680
35	*Journal of Hospitality, Leisure, Sport & Tourism Education*	1.265	377	298
36	*Scandinavian Journal of Hospitality and Tourism*	1.235	617	500
39	*Journal of Tourism and Cultural Change*	1.105	290	262
42	*Tourism Economics*	0.942	162	172

Note. JIF refers to the journal impact factor. Citations refer to the total number of citations received by the journal. Articles refer to the total number of citable articles published in the journal.

Source: Clarivate Analytics (2019a)

Table 1. An example of how a journal's impact factor is computed

Indicator		Journal A	Journal B
Articles			
Number of full-length articles published in 2015 and 2016	(A)	45	34
Number of editorials published in 2015 and 2016	(B)	5	7
Number of commentaries published in 2015 and 2016	(C)	5	7
Number of correspondences published in 2015 and 2016	(D)	5	7
Citations			
Citations for full-length articles published in 2015 and 2016	(E)	270	255
Citations for editorials published in 2015 and 2016	(F)	10	15
Citations for commentaries published in 2015 and 2016	(G)	10	15
Citations for correspondences published in 2015 and 2016	(H)	10	15
Impact factor	**[(E) + (F) + (G) + (H)] / (A)**	**6.67**	**8.82**

Table 2. An example of how a journal's impact factor can be manipulated

	Journal A	Journal B
Citations for article#1	2	10
Citations for article#2	2	0
Citations for article#3	2	0
Citations for article#4	2	0
Citations for article#5	2	0
Citations for article#6	2	0
Citations for article#7	2	6
Citations for article#8	2	0
Impact factor	**2.0**	**2.0**

Table 3. Comparison of generic and speciality journals

	Citation frequency	Impact factor
Generic Journals		
Tourism Management	17,967	5.921
Journal of Travel Research	7,446	5.169
Speciality Journals		
Tourism Geographies	1,412	2.068
Tourism Economics	162	0.942