Do First-Articles in a Journal Issue Get More Cited?

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Introduction

As the advice of peers on the quality of a submitted paper prior to publication, peer review can be regarded as the pre-publication evaluation. Bibliographic citations of scientific papers used as indicators of the visibility, impact, and quality of scientific publications, could be regarded as the post-publication evaluation.

Intentionally or not, journal editors often put the accepted manuscript with nice comments by peer reviewers at the top of all papers in an issue. The First-Articles of journal issues are generally regarded with higher importance, intense creativity or superior quality through peer review process. Judge A, Cable M, Colbert E (2007) deemed that journal editors placed the best paper in the "pole position", and they confirmed this anecdotal evidence further in their study. Specifically, 75% of 16 journals indicated that quality played some primary role in selection of the first articles. Wang (2015) also admitted that journals would choose the very best paper of an issue on the cover, "a paper that in 20 year's time might win a Nobel Prize", according to the opinion of Stang, the EIC of *Journal of the American Chemical society* (Ritter 2006).

Since there are evidences that peer reviewers can successfully discriminate between manuscripts that have a greater chance to be cited in future. Further, in this sense, we made a hypothesis that the best articles selected by peer reviews—usually the First-Articles, will be superior in receiving higher citations after publication. In this paper we will illustrate how peer review and the performance of journal papers measured by bibliometric indicators could concordance with each other. In particular, we examined whether there were obvious citation differences between First-Articles and non-First-Articles published in the same issue of a journal.

Data and Methodology

Twins data, a sampling method used in labour economics, reaches "other things being equal" to a certain extent. Twin studies are often employed to evaluate the inheritance of a trait by dissecting the genetic and environmental contributions to the trait.

In this study, we regard the First-Articles and non-First-Articles in the same issue as twins. They were published in the same time and have similar disciplinary backgrounds.

We select First-Articles from Scopus and Web of Science (WoS). First, we choose journals which publish research articles on their first pages rather than other types of documents, such as editorial, letters et al. And we find that most mathematic journals satisfy this criterion well. Thus we select top100 mathematical journals by their Impact Factors from JCR 2013. Then, we acquire twins data by retrieving articles published in those 100 journals between1995-1999 in Scopus and WoS. As a result, we obtained 19,411 articles in 62 journals in WoS on December 25, 2014 and 18,524 articles in 67 journals in Scopus on January 13, 2015 respectively. The difference of journal numbers is resulted that some journals were not indexed as early as 1995-1999 while included in 2013 JCR. And we identified 2050 out of WoS and 2229 out of Scopus First-Articles, excluding those articles published on supplementary issues, special issues. Table 1 provides an overview of the samples.

Table 1. Descriptive statistics of the samples

	Scopus		WoS	
	Fr	**Non -Fr**	**Fr**	**Non-Fr**
Articles	2229	16295	2050	17361
		67 journals		62 journals

Results

First-Articles receive higher CPP&CTC

The indicator CPP (the average number of citations received per article) and CTC (the contributions to total journal citations) were taken as the criterion to assess the citation position of First-Articles and non-First-Articles in their own disciplinary citation environment. It revealed obvious differences in citations between the First-Articles and non-First-Articles. As shown in Table 2, in WoS, the First-Articles received higher average citation (AC) (16.56) since publishing, while the non-First-Articles got 13.69. In Scopus, the First-Articles accumulated 17.00 of AC, those non-First-Articles of 14.00. In WoS, the First-Articles contribute 12.5% to total citations (TC) of the journal when their proportions in total documents remain only 10.6%. Though the non-First-Articles got 89.4% share of total documents, their contributions of TC remain 87.5%. And the case is almost the same in Scopus: the First-Articles contribute 14.2% to TC when the proportions of articles remain only 12%. Though

the non-First-Articles got 88% of articles, their contributions of TC remain 85.8%.

Based on ANOVA test, we found significant difference between TC of 2050 First-Articles and 17361 non-First-Articles in WoS at the 0.05 significance level. Similarly, in Scopus there is also significantly different between 2229 First-Articles and 16295 non-First-Articles. Specifically, TC of First-Articles is significantly higher than non-First-Articles. From WoS, the non-First-Articles received mean TC of 13.69. While under same circumstance, First-Articles received clearly higher mean TC of 16.56. In terms of Scopus, the non-First-Articles reached at 14.00 of mean TC. And this time, the similar backgrounds, First-Articles performed more excellent, reaching notably higher mean TC of 17.00. Therefore, First-Articles are higher impact than non-First-Articles both in WoS and Scopus.

Table 2. TC difference in ANOVA test

	WoS			Scopus		
	Num	**Mean**	**SD**	**Num**	**Mean**	**SD**
Fr	2050	16.56	30.13	2229	17.00	27.08
N-Fr	17361	13.69	24.03	16295	14.00	24.51
P			0.000			0.000

Nearly 24% First-Articles are most highly cited, while non-cited articles account for only 10%

It shows 22.6% First-Articles in average are also the papers with highest TC among papers published in the same journal issues in WoS. And the proportion keeps stable in the observe window. In Scopus, the percentage of the most highly cited papers in First-Articles goes to almost 25%. In 1997, it even reached a peak of 27%.

Table3. Citation difference of First-Articles and non-First-Articles in WoS& Scopus

	WoS	**Scopus**
CPP-Fr	16.56	17.00
CPP-Non-Fr	13.69	14.00
CTC-Fr	0.125	0.142
CTC-NFr	0.875	0.858
Num highC	463	552
Num zeroC	228	179
highC %	0.226	0.248
ZeroC%	0.111	0.080
ZeroC Total %	0.124	0.107

As shown in Table 3, the percentage of non-cited papers in 62 mathematics journals in WoS is 12.4%. While it is much lower for First-Articles, the uncitedness rate drops to 11.1% in a whole through a period of nearly two decades. As for Scopus database, the share of papers never cited in 67 journals in mathematics decline to10.7%. In addition, the proportion of uncitedness for First-Articles stays to 8.0% on average.

Conclusion

To verify the hypothesis that the best articles selected by peer reviewers, usually the First-Articles, will be superior in receiving higher citations after publication compared with non-First-Articles published in the same journal issue, we first obtained twins data of First-Articles and non-First-Articles by retrieving articles published in top 100 (in terms of JCR 2013 JIF) mathematic journals in Scopus and WoS. Then we employed indicators CPP, CTC and TC, based on which we applied ANOVA to contrast citation bias of First-Articles and non-First-Articles in both Scopus and WoS. Results showed that there existed significant difference between First-Articles and non-First-Articles in receiving citations after publication. On the basis of these empirical grounds, we suggested that the First-Articles are biased in citations compared with non-First-Articles. We also found that it revealed a higher proportion of First-Articles to be most highly cited and comparatively lower proportion to be uncited. Furthermore, it presented a good consistency in conclusion in Scopus and WoS.

The results suggest that the peer reviewer's best recommendation go accordance with highest bibliometric indicator performance. Deliberately or not, papers received best recommendations in pre-publication evaluation process often are arranged as the First-Articles in a journal issue. The First-Articles are generally regarded as ones of high importance intense creativity or superior quality judged by peer reviewers; therefore they are expected to have a greater chance to get highly cited in the future. In fact, such understanding is supported by our analysis in this paper. After publication, those First-Articles are more likely to receive higher citations. Accordingly, peer reviewers' best recommendations and the excellent performance of journal papers measured by bibliometric indicators concordance with each other in the case of First-Articles.

Acknowledgments

We acknowledge the National Natural Science Foundation of China (NSFC Grant No.71373252) for financial support.

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