

## The practice of strategic journal self-citation: It exists, and should stop (A note from the editor-in-chief)

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This note highlights how journal self-citation practices substantially influence impact factor-based journal rankings in the field of Transportation. Furthermore, by means of analyzing Thomson Reuters' most recent Journal Citation Report (JCR), I show that a substantial share of these self-citations is likely to be the result of strategic behavior by editors of journals. I conclude with a call to editors to stop requesting or nudging authors to add journal self-citations to their papers; and a call to authors to stop giving in to editors when being asked to provide such citations<sup>2</sup>.

Before presenting evidence in the form of data and some analyses, I first briefly categorize the various shapes of journal self-citing.

- Regular self-citations. It goes without saying, that journal self-citations are completely harmless when they are based purely on the author's belief that citing a particular paper (from a particular journal) improves the quality of the manuscript she is planning to submit to that journal.
- Self-citations based on author self-censoring. Experienced authors will know that for some or most journals, it improves the probability of successfully passing the journal's review to add a number of citations to papers previously (recently) published in that journal.
- Self-citations due to nudges or request from journals or editors. Some journals explain on their website that it is important for prospective authors to 'acknowledge' (i.e., cite) recently published papers in that journal. In other cases, editors may explicitly suggest or even demand that an author add to his or her paper citations to papers recently published in their journal. Or they may even present the author with a selection of 'potentially relevant papers' which the author is strongly encouraged or even requested to cite. This may occur at various points in the review process, but is most likely to happen after a paper has been conditionally accepted for publication in the journal. It is this type of journal self-citing which I frequently

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<sup>2</sup> Full disclosure: as an author or co-author, I have in several cases accepted a journal's editor's request to cite papers from that journal. In other cases, I even anticipated such requests, and made sure that my paper contained plenty of references to papers published in the journal to which I was planning to submit. As editor-in-chief of EJTIR, I have never asked any author to cite papers previously published in EJTIR; nor does EJTIR, through its website, ask prospective authors to cite previous EJTIR-papers in their submitted articles. This note does not necessarily reflect the opinions of other members of the Editorial (Advisory) Board of EJTIR.

encounter<sup>3</sup>, and which I strongly believe must stop. If it stops, the 'self-censoring' type discussed above will in due time vanish as well.

The table, drawn from Thomson Reuter's most recent Journal Citation Report (i.e., JCR 2013 which was published in June 2014), gives an inverse alphabetic overview of 48 Transportation-related journals. JCR 2013 presents various metrics based on citations received by a journal in the calendar year 2013. I include all journals from JCR's *Transportation* and *Transportation Science & Technology* categories for which a 2-year impact factor (IF) was available<sup>4</sup>. The first column (A) gives the journal's abbreviation, as used in the JCR. The second column (B) gives the (2-year) IF; column (C) gives the IF without journal self-citations. The next column (D) presents the percentage of all citations received in 2013 by the journal, coming from that same journal (i.e., journal self-citations). Next, I present the same percentage as in the previous column, but now related only to the years that are the based for computing the IF (column E). This metric gives the percentage of the journal's IF which is based on journal self-citations. The final columns take the ratio (F), respectively difference (G) of columns (D) and (E). Further below, I will argue that the difference and ratio can both be seen as a proxy of the extent to which journal self-citations are likely to be based on strategic behavior from journals and their editors.

Note that in this piece I will mainly focus on aggregate statistics; it is my aim to criticize a practice, not particular journals. Interested readers may of course investigate how particular journals are doing, by looking at the table in more detail (or, for that matter, they may visit the JCR). Note that based on these data alone, no single journal in particular can be considered guilty of strategic journal self-citation behavior; at the aggregate level however, I will show that evidence can be obtained that the practice exists and may even be pervasive in our field as a whole.

Starting with column (B), the median<sup>5</sup> impact factor (IF) for these 48 journals (i.e., including journal self-citations) equals 1.268, the lowest IF being 0.147, the highest being 5.625. Excluding journal self-citations (column C) makes the range span from 0.137 to 3.052, and reduces the median impact factor to 0.878 (implying a decrease of 44%). In terms of the implied ranking of journals (according to their IF), many journals move more than a few spots up or down the ranking when journal self-citations are excluded; some even climb or fall five or more places. Moving to column (D), the percentage of self-citations over all years (but received in 2013), varies between 1 and 48 percent. For 10 journals it holds that more than a quarter of all citations they received during the year 2013, originated from that same journal. The median percentage of journal self-citations for these 48 journals equals 14.5 percent. The percentage of self-citations over the years that were the base for the 2013-IF (column E), varies between 0 and 48 percent. For 19 (11) journals it holds that more than a quarter (third) of their IF is based on journal self-citations. The median percentage of journal self-citations (as input for their IF) for these 48 journals equals 19.5 percent.

Before moving to the final two columns (F and G), note first that one may be tempted to argue that high levels of journal self-citations are merely stemming from the first category mentioned above (i.e., regular self-citations). Especially when a journal is serving a highly specialist research (sub-)community, this argument may be valid; authors aiming to contribute to that sub-field and publish in its most prominent journal, are likely to cite papers previously published in that journal simply with the aim of acknowledging important previous work. A similar argument has been put forward (Han et al., 2015) for journals that publish a very large number of papers. These

<sup>3</sup> After sending a previous version of this note to my international network, many colleagues informed me that they have had similar experiences.

<sup>4</sup> Except for *Transportmetrica*, which did receive a 2013-IF, but by definition did not receive any self-citations in that year as it ceased to exist; its offspring, *Transportmetrica* Parts A and B did not yet have an IF in JCR 2013.

<sup>5</sup> The mean impact factor is void of much meaning, as it disregards the fact that different journals publish different numbers of papers in a given year.

journals produce a relatively large share of a field's output, and hence it should be less of a surprise that these journals have higher journal self-citation rates; there are simply less other papers to cite. However, if these arguments hold, then at the aggregate level, it is hard to think of a reason<sup>6</sup> why the percentage of journal self-citations to papers published in the years that serve as a base for computing the impact factor would be (much) larger than the percentage of journal self-citations in general. In other words, to the extent that one believes that journal self-citations are 'regular', one would expect that the share of self-citations (as a percentage of total citations) is equally large in years used for the computation of the IF, as it is in all years combined. And this is why the final columns, presenting the ratio (F), respectively the difference (G), between the percentage of journal self-citations that helped inflate the IF and the over-all percentage of journal self-citations, becomes relevant.

Starting with the ratio (column F), the result is striking: for all but 9 journals, the ratio between i) the percentage of journal self-citations that helped inflate the 2013 IF (i.e., to papers published in 2011 and 2012) and ii) the percentage of journal self-citations in general is larger than one. Of course, ratios relatively close to 1 are likely to be the result of mere coincidence and should certainly not be too easily interpreted as signs of strategic self-citation behavior, and especially so for journals where the absolute number of journal self-citations is small. For 22 out of 48 journals, the ratio is 1.50 or larger. For 7 of these 22 journals, the ratio is larger than 2, and for 1 of these 7 journals the ratio is even larger than 3. However, even for journals with such a relatively high ratio, this should still not be easily taken to be evidence of strategic journal self-citation, for the reason may still be related to pure chance (especially when the percentages of journal self-citations are relatively low). But, at the aggregate level of the field as a whole, one should expect that such noise at the journal level cancels out, leading to a distribution where around 50% of journals has a ratio smaller (larger) than 1, implying a median ratio of around 1. This however, turns out not to be the case. As mentioned, the distribution of ratios is heavily skewed towards the right (39 out of 48 journals having a ratio larger than 1); the median equaling 1.39. In other words, for the median journal, the share of journal self-citations to 'impact factor-relevant years' is 39% larger than what would be expected if strategic behavior plays no role.

As said, for journals with a low percentage of journal self-citations in general, the ratio may paint an unfair picture: take a journal with 3% of journal self-citations in general, and 6% in IF-years. Such a presumably 'honest' journal would be assigned the same ratio as a potential 'culprit' with 30% of journal self-citations in general, and 60% in IF-years, while in the former case the high ratio is far more likely to be the result of random noise, than in the latter case. That is why I also present the *difference* the two percentages (column G), which is robust against this type of misinterpretation. The number of journals with a positive difference is of course equally large as the number with a ratio larger than 1 (i.e., 39 out of 48 journals). For 25 of these journals, the difference is 5 percentage points or larger (5 being also the median difference for the 48 journals); for 14 of those journals, the difference is even 10 percentage points or larger. For three journals, the difference between the share of self-citations to IF-years and the share of self-citations in general, is larger than 20 percentage points. As expected, some of the journals that were assigned a high *ratio*, are assigned a small *difference* – these are journals with low shares of self-citations in general, for which the difference gives a more reliable proxy for (the absence of) their strategic behavior.

The fact that the median ratio (difference) across 48 journals is substantially larger than 1 (0) implies that at the aggregate level of our research field, the share of journal self-citations to IF-years is substantially larger than one would expect if strategic behavior by journals were not taking place. To me, this is strong (albeit indirect) evidence that several journals and editors trigger and use self-citations strategically, i.e., to help improve the journal's IF.

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<sup>6</sup> See the Appendix for an attempt to construct such alternative lines of reasoning.

Now some of those who agree that this practice exists, may still ask what is the problem, i.e., why the strategic generation of journal self-citations is problematic. I can think of several reasons, including the following: first, research and the papers stemming from research, should be real. We, as scholars, do not accept false data; why should we accept false citations? A second reason is more pragmatic, but not less important: journal impact factors and implied rankings play a large – and in some countries growing – role in various important academic processes, ranging from journal selection (by authors), the distribution of research grants (by funding agencies) and the determination of who receives tenure (by universities). If the underlying system of metrics is not 100% fair, this will result in suboptimal decisions and consequences at various levels. Of course, one may argue (and several scholars have done so recently), that the whole notion of an IF is a flawed metric. My personal viewpoint is that the IF, albeit being an incomplete measure of journal quality, does contain useful information about a journal's academic impact – *to the extent that it is not manipulated by means of strategic use of journal self-citations.*

To conclude, having surveyed the evidence and argumentation presented in this note, the reader is of course entitled to his or her own opinion, taking into account personal experiences as well. However, my conclusion which is based on: i) my personal experience as an author; ii) the plethora of additional case study evidence which I received from fellow scholars in response to sending a previous version of this note to my network; and iii) the analyses presented above, is clear. The practice of strategic journal self-citations is pervasive in our field, and it should stop. I intend to do my 'share of the work' in terms of refusing future editorial requests for journal self-citations; I encourage journal editors (and authors) to think about this issue, and to draw their own conclusions.

## Acknowledgements

This note has benefited substantially from many remarks and suggestions<sup>7</sup> which I have received after spreading a previous version to my Dutch and international colleagues. Thank you, all!

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<sup>7</sup> Bert van Wee, having received from me an earlier draft of this note, pointed me towards a very interesting paper presented at TRB this January. That paper, a reference to which is given at the end of this note, discusses the impact factor of TRB's journal (Transportation Research Records or TRR). The authors present a tool to study strategic journal self-citation. It does not focus on potential discrepancies between journal self-citations to IF year-papers and those to papers in general (as I do), but it is based on the share of journal self-citations compared to the relative size of the journal's output in published papers as a share of the field's output in general. Their 'Fair Self-Cite Rate (FSCR)' is larger than 1 if articles published in a journal cite other articles within the same journal at a rate greater than the proportion of articles in the field that are published in that journal. For example, if a journal publishes 50% of a field's papers, it 'is allowed to have' a journal self-citation share of 50% as well (i.e., implying an FSCR of 1). The authors find (based on an analysis of JCR 2011 and 2012) that the FSCR is larger than 1 for almost every journal in our field. Comparing their results with mine, roughly the same journals can be identified as 'negative' outliers. The authors' findings – although not focusing on IF manipulation per se, but on excessive journal-self citation in general – thus appear to be largely in line with mine. I don't agree however with their recommendation, which they reach after noticing that TRR appears to have a relatively low (=fair) FSRC, that "would-be authors should be strongly encouraged to review all recent and upcoming publications in TRR in the subject area, and the review process should take this into consideration." (page 11). Rather, I would suggest that *other journals stop their strategic self-citation practices*, so that we can end the arms race currently taking place.

| <i>A</i>             | <i>B</i>  | <i>C</i>                 | <i>D</i>              | <i>E</i>                     | <i>F</i>     | <i>G</i>     |
|----------------------|-----------|--------------------------|-----------------------|------------------------------|--------------|--------------|
| <i>Journal name</i>  | <i>IF</i> | <i>IF w/o self-cites</i> | <i>Self-cites (%)</i> | <i>Self-cites (%) for IF</i> | <i>Ratio</i> | <i>Diff.</i> |
| TRANSPORT-VILNIUS    | 0.529     | 0.365                    | 14                    | 30                           | 2.143        | 16           |
| TRANSPORTATION       | 1.617     | 1.435                    | 7                     | 11                           | 1.571        | 4            |
| TRANSPORT SCI        | 2.294     | 2.191                    | 4                     | 4                            | 1            | 0            |
| TRANSPORT REV        | 1.681     | 1.431                    | 8                     | 14                           | 1.75         | 6            |
| TRANSPORT RES REC    | 0.556     | 0.312                    | 22                    | 43                           | 1.955        | 21           |
| TRANSPORT RES F      | 1.635     | 1.357                    | 15                    | 16                           | 1.067        | 1            |
| TRANSPORT RES E      | 2.193     | 1.830                    | 11                    | 16                           | 1.455        | 5            |
| TRANSPORT RES D      | 1.626     | 1.497                    | 4                     | 7                            | 1.75         | 3            |
| TRANSPORT RES C      | 2.820     | 2.196                    | 20                    | 22                           | 1.1          | 2            |
| TRANSPORT RES B      | 3.894     | 2.618                    | 15                    | 32                           | 2.133        | 17           |
| TRANSPORT RES A      | 2.525     | 1.980                    | 12                    | 21                           | 1.75         | 9            |
| TRANSPORT POLICY     | 1.718     | 1.456                    | 16                    | 15                           | 0.938        | -1           |
| TRANSPORT PLAN TECH  | 0.255     | 0.255                    | 7                     | 0                            | 0            | -7           |
| TRANSPORT J          | 0.326     | 0.239                    | 16                    | 26                           | 1.625        | 10           |
| TRANSP LETT          | 0.410     | 0.359                    | 7                     | 12                           | 1.714        | 5            |
| TRAFFIC INJ PREV     | 1.286     | 1.046                    | 16                    | 18                           | 1.125        | 2            |
| ROAD TRANSP RES      | 0.255     | 0.235                    | 6                     | 7                            | 1.167        | 1            |
| PROMET-ZAGREB        | 0.292     | 0.151                    | 48                    | 48                           | 1            | 0            |
| P I MECH ENG F-J RAI | 0.743     | 0.610                    | 14                    | 17                           | 1.214        | 3            |
| P I MECH ENG D-J AUT | 0.645     | 0.540                    | 10                    | 16                           | 1.6          | 6            |
| P I CIVIL ENG-TRANSP | 0.321     | 0.302                    | 31                    | 5                            | 0.161        | -26          |
| NETW SPAT ECON       | 1.803     | 1.131                    | 18                    | 37                           | 2.056        | 19           |
| MOBILITIES-UK        | 1.169     | 0.892                    | 19                    | 23                           | 1.211        | 4            |
| MARIT POLICY MANAG   | 1.447     | 0.842                    | 29                    | 41                           | 1.414        | 12           |
| MARIT ECON LOGIST    | 1.045     | 0.864                    | 13                    | 17                           | 1.308        | 4            |
| J TRANSP GEOGR       | 2.214     | 1.502                    | 29                    | 32                           | 1.103        | 3            |
| J TRANSP ENG         | 0.877     | 0.710                    | 9                     | 19                           | 2.111        | 10           |
| J TRANSP ECON POLICY | 0.592     | 0.510                    | 5                     | 13                           | 2.6          | 8            |
| J SAFETY RES         | 1.303     | 1.227                    | 4                     | 5                            | 1.25         | 1            |

| A                    | B         | C                        | D                     | E                            | F            | G           |
|----------------------|-----------|--------------------------|-----------------------|------------------------------|--------------|-------------|
| <i>Journal name</i>  | <i>IF</i> | <i>IF w/o self-cites</i> | <i>Self-cites (%)</i> | <i>Self-cites (%) for IF</i> | <i>Ratio</i> | <i>Diff</i> |
| J PUBLIC TRANSPORT   | 0.414     | 0.276                    | 10                    | 33                           | 3.3          | 23          |
| J INTELL TRANSPORT S | 1.250     | 0.694                    | 26                    | 44                           | 1.692        | 18          |
| J AIR TRANSP MANAG   | 0.849     | 0.663                    | 14                    | 21                           | 1.5          | 7           |
| J ADV TRANSPORT      | 1.878     | 1.388                    | 19                    | 26                           | 1.368        | 7           |
| ITE J                | 0.147     | 0.137                    | 5                     | 6                            | 1.2          | 1           |
| INT J VEHICLE DES    | 0.239     | 0.239                    | 8                     | 0                            | 0            | -8          |
| INT J TRANSP ECON    | 0.517     | 0.310                    | 17                    | 40                           | 2.353        | 23          |
| INT J SUSTAIN TRANSP | 1.447     | 0.947                    | 20                    | 34                           | 1.7          | 14          |
| INT J SHIP TRANS LOG | 1.340     | 0.787                    | 41                    | 41                           | 1            | 0           |
| INT J HEAVY VEH SYST | 0.239     | 0.174                    | 14                    | 27                           | 1.929        | 13          |
| INT J ENGINE RES     | 1.400     | 1.113                    | 15                    | 20                           | 1.333        | 5           |
| INT J AUTO TECH-KOR  | 0.821     | 0.546                    | 28                    | 33                           | 1.179        | 5           |
| IET INTELL TRANSP SY | 0.954     | 0.839                    | 16                    | 12                           | 0.75         | -4          |
| IEEE VEH TECH MAG    | 1.567     | 1.537                    | 1                     | 1                            | 1            | 0           |
| IEEE T VEH TECHNOL   | 2.642     | 2.298                    | 8                     | 13                           | 1.625        | 5           |
| IEEE T INTELL TRANSP | 2.472     | 1.401                    | 27                    | 43                           | 1.593        | 16          |
| EUR J TRANSP INFRAST | 1.023     | 0.930                    | 8                     | 9                            | 1.125        | 1           |
| COMPUT-AIDED CIV INF | 5.625     | 3.052                    | 30                    | 45                           | 1.5          | 15          |
| ACCIDENT ANAL PREV   | 2.571     | 1.600                    | 35                    | 37                           | 1.057        | 2           |

## Reference

Han, L.D., Nambisan, S.N., Lemons, E.L., Cherry, C., 2015. Fair representation of Transportation Research Record's impacts: A case study on Journal citations reports' Impact factor. Paper presented at the 2015 meeting of the Transportation Research Board, Washington, DC. (14 pages)

## Appendix:

### Possible alternative reasons for the observed asymmetry between journal self-citations shares to papers published in IF-years, and papers published in all years combined

As explained in the main text, ratios larger than 1 and differences larger than 0 as presented in the Table, reflect an imbalance between on the one hand the share of journal self-citations (as a percentage of total citations) to papers published in IF-years, and on the other hand the share of journal self-citations to papers published in all years combined. This imbalance in turn suggests that papers submitted to journal A (taken to be a journal with a high ratio or difference in the Table) are *relatively* more likely to cite recent papers published in A than old papers published in A, *compared* to the extent to which papers submitted to some other journal B are more likely to cite recent papers published in A than old papers in A. In other words, a high reported ratio or difference suggests that papers submitted to journal B are relative laggards in terms of their citation of papers published in journal A (in the sense that they cite A's older papers), compared to papers submitted to journal A (which have a preference for citing A's newer papers). Based on my own experiences as an author and editor, and taking into account suggestions received from fellow scholars in response to a previous version of this note, I can think of broadly two scenarios which help explain part of the above-described imbalance, and which do not relate to strategic behavior of editors or self-censoring by authors.

First, a reader of journal A may find a paper in its newest issue so interesting, that she decides to do follow up research, e.g. to explore the validity or properties of a recently proposed method, or test the applicability of a recently reported empirical finding in a different geographical context. She is then of course more likely to submit the resulting paper to journal A, than to another journal B. If the time to do the research, write the paper, and having it reviewed and published (given that it is accepted in journal A) does not consume too much time – i.e., no more time than about two years in total – this scenario could lead to a potential overrepresentation of journal A's self-citations to papers published in IF-years, compared to the share of journal self-citations to papers in all years combined.

Second, an author, after having written a paper, may take a look at her finalized reference list to find out where the most recent papers cited in her reference list have been published. She may consider that the fact that a paper about her paper's topic has been *recently* published in journal A is a signal of A's *current* interest in the topic; in line with this consideration, she goes on to submit her work to journal A as opposed to some other journal B.<sup>8</sup> Depending on the exact timing of the review process and the paper's subsequent publication, this scenario too implies a potential overrepresentation of journal A's self-citations to papers published in IF-years.

Although both scenarios are likely to explain some of the observed overrepresentation of journal self-citations to IF-year papers, there are two pieces of counter-evidence which together make it unlikely that these scenarios explain a large share of the overrepresentation observed in the JCR-data. First, if the two scenarios were a very important explanation for the overrepresentation of journal self-citations to IF-years, one would expect only a small difference between the share of journal self-citations for the two IF-years and that for the most recent non-IF-year. That is, given the above two scenarios one would expect a *gradually* decreasing share of journal self-citations over time. However, for many journals JCR 2013 data show that the difference in self-citation shares between on the one hand 2012 and 2011 (the IF-years), and on the other hand 2010, is generally very stark and in favor of the IF-years. Combined with the abundance of case study-evidence referred to in the main text, this suggests an important role of *strategic* behavior.

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<sup>8</sup> Note the subtle but important difference between the described scenario, and the scenario where an author *first* decides to submit her paper to journal A, and *then* starts adding to her paper references to recent work published in A, in order to increase the probability of getting the paper accepted in A. The latter scenario amounts to what I have called 'author self-censoring', while the former scenario can be considered a form of regular self-citation.

Chorus

The practice of strategic journal self-citation: It exists, and should stop

Nonetheless, the two scenarios described above do provide another reminder that the analysis of JCR-data presented in this note should be interpreted with care, and should not be used too easily to judge the behavior of any journal in particular.