

Nuredini, Kaltrina; Latif, Atif; Peters, Isabella

**Conference Paper**

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Suggested Citation: Nuredini, Kaltrina; Latif, Atif; Peters, Isabella (2017) : Case study on open access journals in Economics and Business Studies and their engagement on the Web, <http://dx.doi.org/10.5281/zenodo.891225>

This version is available at:  
<http://hdl.handle.net/11108/330>

**Kontakt/Contact**

ZBW – Leibniz-Informationszentrum Wirtschaft/Leibniz Information Centre for Economics  
Düsternbrooker Weg 120  
24105 Kiel (Germany)  
E-Mail: [info@zbw.eu](mailto:info@zbw.eu)  
<http://zbw.eu/de/ueber-uns/profil/veroeffentlichungen-zbw/>

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# Case study on open access journals in Economics and Business Studies and their engagement on the Web

Kaltrina Nuredini\*, Atif Latif<sup>\*1</sup>, Isabella Peters<sup>\*(\*)</sup>

\*k.nuredini@zbw.eu; a.latif@zbw.eu; i.peters@zbw.eu

Web Science, <sup>\*1</sup>ZBW - Leibniz Information Centre for Economics, Düsternbrooker Weg 120, Kiel,

(\*)Kiel University, Christian-Albrechts-Platz 4, Kiel  
(Germany)

## Abstract

In the beginning of 2001 Lawrence showed that Open Access (OA) papers have a citation advantage (Lawrence, 2001) over closed access articles. Since then several research studies have arrived at the same results (e.g., Archambault et al., 2015; Wang et al., 2015). According to Wang et al., (2015) OA citation entails more advantage by collecting more usage metrics and social media attention. In recent years altmetrics accumulated from social media are used and studied by researchers (Priem, 2011; Piwowar, 2013; Bornmann, 2014). Many interdisciplinary studies confirm that altmetrics reveal a different impact from citation nevertheless there's a positive and moderate correlation with each other (Costas et al., 2014; Nuredini & Peters, 2015). Altmetric information differentiates from a discipline to a discipline where the amount of papers found varies across social media sources. Nuredini and Peters (2015) reveal the top 3 most used altmetric sources (Mendeley, Twitter, News) for Economic and Business Studies (EBS) whereas Costas et al. (2014) outline that biomedical and health science publications are mostly found on Facebook, Twitter and Blogs.

Since OA journals are free to read it is important to see whether openness can lead to more attention online in comparison with closed journals. Therefore the study looks at OA journals and their altmetric information in the field of EBS and aims at answering the following research questions:

RQ1: What is the coverage of OA journal articles in EBS in Altmetric.com and what are frequent social media services generating altmetrics for EBS?

RQ2: Do OA journals have more altmetric sources as compared to closed journals/articles?

RQ3: Do papers with higher Altmetric.com scores possess higher citation counts and vice versa?

## Methods and Data

We selected the top 10 OA journals in EBS from *The SCImago Journal & Country Rank*<sup>1</sup> according to their h-indexes which Scimago develops from the Scopus<sup>2</sup> database. The journals are open access, with publication years from 2012 till 2016 and are published in the countries Germany, UK and USA. Crossref<sup>3</sup> was used for the journals' metadata information and Altmetric.com<sup>4</sup> for altmetric information. We found only four OA journals out of ten with 489 papers published in 2012-2016 and available in Altmetric.com. The OA journals are compared with closed journals with the same publication years and comparable h-indexes (although there are only three OA-journals in EBS that have a h-index higher than 8) (Table 1). For the journal *International Journal of Health Geographic's* we found 253 unique articles in Altmetric.com and 248 papers in Crossref. Although we checked for duplicates the reason why Crossref included fewer papers is unknown. Therefore we calculate our analysis based on the values mentioned in Table 1 with 253 papers.

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<sup>1</sup> <http://www.scimagojr.com/>

<sup>2</sup> <https://www.scopus.com/home.uri>

<sup>3</sup> <https://www.crossref.org/>

<sup>4</sup> <https://www.altmetric.com/>

| Open Access Journals                         |                 |                      |                             |         | Closed Journals            |                 |                      |                             |         |
|--|-----------------|----------------------|-----------------------------|---------|----------------------------|-----------------|----------------------|-----------------------------|---------|
|  | # DOIs Crossref | # DOIs Altmetric.com | Coverage of Altmetric.com % | H-index |                            | # DOIs Crossref | # DOIs Altmetric.com | Coverage of Altmetric.com % | H-index |
| Interfaces                                   | 283             | 166                  | 59%                         | 53      | American Economic Journal  | 210             | 138                  | 66%                         | 49      |
| International Journal of Health Geographic's | 248             | 253                  | 100%                        | 53      | Emerging Market Review     | 216             | 48                   | 22%                         | 35      |
| Theoretical Economics                        | 171             | 27                   | 16%                         | 20      | European Accounting Review | 198             | 107                  | 54%                         | 35      |
| Series                                       | 68              | 43                   | 63%                         | 8       | Accounting Education       | 191             | 65                   | 34%                         | 20      |
| Total articles / 2012-2016                   | 770             | 489                  | 64%                         |         | Total articles / 2012-2016 | 815             | 358                  | 44%                         |         |

Table 1. Description of articles found in Crossref and Altmetric.com for OA and closed journals.

## Results

**RQ1.** In Altmetric.com 64% of 770 DOIs from OA journals are found, where on the other hand only 44% of DOIs could be retrieved from closed journals. Altmetric.com collects Mendeley readership data for a DOI when at least one other social media indicator (such as twitter, blogs, etc.) has been found (Costas et al., 2014). The top three social medial sources where OA journal articles are mostly found are Mendeley, Twitter and Facebook. Among the analyzed OA journals the International Journal of Health Geographic's gained an Altmetric.com score of 1,364 (the altmetric score is summed up on journal level) for OA journals whereas for the closed journals the American Economic Journal received the top value of 3,454 in the altmetric score. Table 2 lists the top three altmetric sources where OA and closed journals/articles are found. The # means the sum of all counts per social media source aggregated on journal level.

| Open Access Journals                         | # Mendeley | # Twitter | #Facebook         |
|--|------------|-----------|-------------------|
| Interfaces                                   | 2,141      | 102       | 14                |
| International Journal of Health Geographic's | 11,003     | 1,331     | 288               |
| Theoretical Economics                        | 33         | 6         | 1                 |
| Series                                       | 389        | 220       | 3                 |
| Closed Journals                              | # Mendeley | # Twitter | #Policy Documents |
| Accounting Education                         | 720        | 10        | 1                 |
| American Economic Journal                    | 6,109      | 1,752     | 107               |
| Emerging Markets Review                      | 1,239      | 33        | 3                 |
| European Accounting Review                   | 2,990      | 16        | 4                 |

Table 2. Top 3 aggregated Altmetric sources for OA and closed journals.

**RQ2.** In our dataset Altmetric.com has provided altmetric data for 17 social media sources as shown in Table 3. The sum of all counts per source is indicated by #. Both, OA journals/articles and closed journals/articles are found in 11 sources. However, only OA journals/articles can be found in videos whereas only closed journals/articles appear in Weibo.

| Altmetric Sources  | # OA   | # Closed |
|--------------------|--------|----------|
| Mendeley           | 13,566 | 11,058   |
| Twitter            | 1,659  | 1,841    |
| Facebook           | 306    | 115      |
| Blogs              | 40     | 75       |
| Number of Stories  | 28     | 184      |
| Google             | 24     | 3        |
| Policy Documents   | 16     | 114      |
| Wikipedia          | 12     | 16       |
| Reddit             | 3      | 18       |
| Q&A                | 2      | 3        |
| Videos             | 1      | 0        |
| Peer review        | 0      | 0        |
| Weibo              | 0      | 2        |
| Linkedin           | 0      | 0        |
| Pins               | 0      | 0        |
| Research Highlight | 0      | 0        |
| Syllabi            | 0      | 0        |

Table 3. Social media sources and their aggregated counts across 4 OA and closed journals.

**RQ3.** We selected the top five papers based on altmetric scores for each journal type, i.e. 20 OA-articles and 20 closed articles. For those 40 articles citation counts via Google Scholar<sup>5</sup> were manually collected. To check whether OA and closed articles gain similar values of citations and altmetric score (on journal level) correlations (Pearson and Spearman) were calculated. The results are shown in Table 4.

| Open Access Journals/Articles   | Pearson | Spearman |
|---------------------------------|---------|----------|
|                                 | .096    | -.149    |
| Closed Access Journals/Articles | .382    | .277     |

Table 4. Correlation coefficients (Altmetric Score on journal level & citations) for OA and closed Access articles.

## Conclusions

We studied the top 4 journals of OA and closed access from EBS to see their coverage on the social web. The first result showed that OA journals are not well covered in Altmetric.com because we found only four out of ten with altmetric data. However, the found journals statistics show that OA journals have a higher coverage with 65% of papers as compared to closed journals (44%). Both OA and closed journals have Mendeley and Twitter as their top sources and are distinct at the third source. OA journals are mostly found in Mendeley and

<sup>5</sup> <https://scholar.google.de/>

Facebook environments whereas closed journals are available in Twitter and in Stories. However, Mendeley values might be underestimated because of the altmetric.com data selection process. Altmetrics for closed journals/articles span over more social media sources and their altmetric counts are higher than those of OA journal/articles. For closed journals the known moderate and positive correlation between citations and altmetrics is confirmed. For OA journals, however, we see a weak indication for a negative relation between altmetrics and citations which means that the more the journal is cited the less altmetrics the journal gets or the more altmetrics it gets the fewer it is cited. Based on the case study the openness of journals doesn't lead to a more online attention.

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