Economists behaving badly: Publications in predatory journals

Wallace, Frederick and Perri, Timothy

1 June 2016

Economists Behaving Badly: Publications in Predatory Journals

By

Frederick H. Wallace
Department of Economics and Finance
Gulf University for Science and Technology
West Mishref, Kuwait
wallace.f@gust.edu.kw

and

Timothy J. Perri
Department of Economics
Appalachian State University
Boone, North Carolina

June 1, 2016

Keywords: Predatory Publications, RePEc
JEL Codes: A10, I20

Abstract: The extent of publishing in predatory journals in economics is examined in this paper. A simple model of researcher behavior is presented to explore those factors motivating an economist or other academic to publish in predatory journals as defined by Beall (2015). Beall's lists are then employed to identify predatory journals and publishers included in the Research Papers in Economics (RePEc) archives. Once identified, the affiliations of authors publishing in these outlets are determined in order to identify the characteristics of those publishing in such outlets. The geographic dispersion of authorship is widespread. A very small subset of authors is registered on RePEc. Slightly more than forty percent of registered authors who publish in predatory journals in the data set have six or fewer publications, and hence might be considered inexperienced. A surprising number of authors who are in the RePEc top 5% also published in predatory journals in 2015.

Introduction

Within the educational system of the developed world, the distinguishing feature that sets universities apart from other components of the system is the expectation that faculty contribute to the knowledge base of their specialties. The growth of the Internet and, more generally, globalization has coincided with, or perhaps fostered, an increased emphasis on scholarly publishing in academia worldwide. Promotion, merit pay, tenure (where it exists), and hiring and firing decisions in many universities depend on the publications of faculty members. Standards, of course, still differ within and across countries, but an institution that does not demand some evidence of scholarly activity is in the minority in most places, and a rarity in many.

The increase in research output has been accompanied by an expansion in the number of journals. The open access journal model is a relatively inexpensive form for publishing scientific work contributing to the expansion in the number of outlets for scholarly communication [see West, Bergstrom, and Bergstrom (2014) and the citations therein]. Certainly, some open access journals follow the ethical standards and practices one expects from the traditional print journals; most importantly, they have a thorough review process, so that only those papers deemed to contribute to the body of knowledge in economics are actually accepted for publication. Unfortunately, some open access outlets perform cursory reviews of submissions, with accepted papers published contingent on the authors' payment of a substantial fee. Shen and Björk (2015) succinctly describe the process on the first page of their paper"…publishers repositioned themselves as service providers to the authors, publishing with them, rather than seeing themselves as content providers to readers." Jeffrey Beall maintains a list of publishers of such journals and another of stand-alone journals that perform little or no review, charge post-acceptance publication fees, and satisfy his criteria for classification as predatory at the Scholarly Open Access blog (http://scholarlyoa.com/). Of course, the pay-for-publication practice has a long history when applied to books with this sector of book publishers pejoratively referred to as 'vanity press.'

The extent of publishing in predatory journals in economics is examined in this paper.[1] Beall's lists are employed to identify predatory journals and publishers included in the Research Papers in Economics (RePEc) archives. It is assumed that a publisher on Beall's list publishes only predatory journals since it is hard to imagine a viable business model in which a publisher has sufficiently lax standards in some journals so that they would be classified as predatory and high standards for others. Once identified, the affiliations and other characteristics of authors publishing in these outlets are compiled. A priori, one expects that most publications in predatory journals will be from authors in junior ranks outside the industrialized countries since these countries are more likely to have low-ranked universities with weaker publishing standards than those in the developed world.

Literature

Several studies have looked at publishing in open access journals. Bohannon (2013) submitted virtually identical papers on the anticancer properties of a type of lichen to 304 open access journals. The methodology described in the paper was intentionally flawed in ways that should have been obvious and noted during a competent review. The paper was accepted by more than half of the journals to which it was submitted. Djuric (2015) discusses the academic setting in Serbia after 2007 when state universities began requiring publications in journals having Thomson Reuters (TR) impact factors for completion of a Ph.D or promotion. Djuric describes the submission of a sham paper to a journal with TR impact factor in which "hundreds of Serbian scientists published hundreds of articles …in only a couple of years." (page 184) The journal in question charges for publication after acceptance. The purpose of the sham paper was to test the authors' impression that the journal conducted little if any review of submissions. The article was accepted the day after submission. No referee reports were provided with the acceptance e-mail. After payment of an invoice for €290 the journal scheduled publication in a subsequent issue.

[1] One of the authors recently served on his department's recruitment committee. About half of the applicants had one or more publications in journals on Beall's list of stand-alone predatory journals, or published by a company on Beall's list of predatory publishers.

Shen and Björk (2015) draw a sample of journals from Beall's lists of predatory journals and publishers to determine the characteristics of the journals and details of the authors. Almost forty-five percent of the journals are published in India or North America. The publisher's location could not be determined for nearly twenty-seven percent of the journals. In a separate sample of contributors, more than seventy-five percent of the authors are from Asia and Africa. The average APC or article processing (or publishing) charge is $178. Xia (2015) compiles information on the APCs of 214 journals on Beall's list in early 2014. Most predatory journals he examines charge less than $100 for the APC, and few charged more than $200.

Omobowale (2014) asserts that such criteria as impact factor are generally ignored in the evaluation of faculty publications when making appointment and promotion decisions in Nigerian universities. Instead, the primary criterion for promotion is whether the papers are in journals published outside Nigeria. He conducts interviews with thirty faculty members in two public universities to ascertain their views regarding publications in predatory journals. He also interviews eight senior Nigerian faculty involved in hiring and promotion in these same universities. The four most common reasons given for publishing in predatory journals are promotion of other faculty based on such publications, the desire for quick promotion, a lack of oversight in evaluations, and ignorance. It is noteworthy that three of the four justifications for publishing in predatory journals suggest an optimizing decision by a faculty member based on full information about the predatory journals and the promotion process, rather than a lack of knowledge regarding the quality of the target journal.

Xia *et al*. (2015) are interested in the characteristics of authors publishing in predatory journals. They select seven pharmaceutical science journals on Beall's list, referred to as group 1 in their discussion. Using the author data available from the journals and the Web of Science, Xia *et al*. compile data on authors who published in one of the Beall's list journals in 2013. For comparison they select a second group of five open access, pharmaceutical journals that rejected Bohannon's sham paper and a third group of five open access journals with high impact factors from the Public Library of Science (PLoS) and compile data on authors of papers these two groups of journals in

2013.[2] None of the journals in the comparison groups appeared on Beall's list at the time of the study. Their data show that 75% of predatory journal authors are from South Asia, especially India, and 14% from Africa. About 15% of authors in the second group of journals and less than 5% of PLoS journal articles are by researchers in these two locations. Xia et al. also find that group 1 authors have fewer publications and are cited less than group 2 authors leading to their overall conclusion that the authors of articles in predatory journals are typically inexperienced and from developing countries.

Theory

What does a traditional journal do? Expanding on the succinct description of journals as 'content providers to readers' (Shen and Bjorkdate??), a traditional journal screens paper quality for its subscribers. So as not to impose the entire cost of screening on the reader and recognizing that publishing a paper creates a positive return to the author(s), a submission fee is often required *before* a paper is assessed for quality. Revenue is derived from subscriptions and submission fees. The upfront submission fee makes the editorial decision to accept or reject independent from the journal's revenue source.

What does a predatory journal do? Again from Shen and Bjork, the publisher has become a "service provider to the authors." A predatory journal or publisher provides two services to authors; it offers a rapid decision, albeit based on a cursory or non-existent review of the paper, and it sells space in a journal to authors.[3] If any screening for article quality takes place it is limited. An article processing charge is imposed on the author(s) *after* acceptance creating an incentive to accept papers in order to increase revenue. Predatory journals are open access so publication costs are relatively low compared to a print journal. The marginal cost of publishing a paper is likely very small.

We abstract from journal behavior in this paper, instead focusing on the motivation of authors with a simple model. *Papers* are unpublished. *Publications* are just that; published papers. Suppose there are two kinds of papers: high quality and low quality.

---

[2] Given the large number of papers in the PLoS journals they started with the first issue of each and compiled the author characteristics, stopping once they had data for 300 authors.

[3] For a particularly egregious case see Mazieres and Kohler (2005) and the related story in https://scholarlyoa.com/2014/11/20/bogus-journal-accepts-profanity-laced-anti-spam-paper/ .

With n_l the number of low quality papers, and n_h the number of high quality papers produced by an author, the effort cost of producing papers is $c\frac{n_h^2}{2}$ for high quality papers, and $\frac{n_l^2}{2}$ for low quality papers, with $c > 1$.

All papers have a 100% chance of being published in bad journals.[4] Low quality papers have zero chance of being published in good journals. High quality papers have a probability θ of being published in good journals, where $\theta \in [0,1]$ is a measure of individual ability. Thus a high quality paper will be published in a bad journal with a probability of 1-θ.

Universities value the quality-weighted number of articles, and will pay v for a quality-weighted article. Thus, compensation is given by
$v[\alpha$ (# of publications in good journals) + (1-α) (# of publications in bad journals)], with $½ \leq \alpha \leq 1$. It is assumed publications in good journals are never valued less than publications in bad journals, so $½ \leq \alpha$. If $\alpha = ½$, all publications would be valued the same. If $\alpha = 1$, only publications in good journals would be valued. Clearly both v and α may vary across universities.

For simplicity, assume an author can only work on one type of paper.[5] First consider an individual who produces high quality papers. The individual's objective is:

$$\max_{n_h} \left\{ v n_h [\alpha\theta + (1-\alpha)(1-\theta)] - \frac{c n_h^2}{2} \right\} \quad (1)$$

We then have:

$$n_h = \frac{v}{c}[\alpha\theta + (1-\alpha)(1-\theta)]. \quad (2)$$

Now consider an individual who produces low quality papers. The author's objective is:

[4] Allowing for the fact that some papers do not get published anywhere would not materially affect the results.

[5] One way to justify this assumption is if there is some fixed cost of producing high quality papers, a cost for which some universities compensate a professor. For example, summer research support may be taken away if sufficient good journal articles are not produced.

$\max_{n_l} \left\{ v(1-\alpha)n_l - \frac{n_l^2}{2} \right\}$, yielding (3)

$n_l = v(1-\alpha)$. (4)

1. How would behavior differ for similar individuals producing different types of papers?

Suppose individuals with the same value of θ are employed at institutions with the same values of v and α, but where some are provided the support to produce high quality papers (see footnote five), and others do not receive such support. We first consider who would produce more papers. Since all papers are assumed to be published, this also means more publications. Using equations (2) and (4), individuals producing high quality papers would produce more papers and publications (in good and bad journals) than individuals producing low quality papers if:

$$\alpha\theta + (1-\alpha)(1-\theta) > c(1-\alpha). \quad (5)$$

If $\alpha = ½$ all publications are valued the same so that $LHS_{(5)} = ½ < RHS_{(5)} = c/2$ thus fewer high quality papers are produced than low quality papers. Even if a lump sum payment, such as a summer research grant, were given to those who produced high quality papers there would still be more low quality papers produced than high quality papers, and there would be more total publications by those who produced low quality papers than by those producing high quality papers when $\alpha = ½$. If $\alpha = 1$ there is no value to low quality papers so that $LHS_{(5)} = 1$ and the $RHS_{(5)} = 0$. Without reward for publications in bad journals, no one would produce low quality papers.

Let us also consider the midpoint of the range for α, $\alpha = ¾$. Then $LHS_{(5)} = ¼ + \frac{\theta}{2}$, and $RHS_{(5)} = \frac{c}{4}$. If $\theta > \frac{c-1}{2}$ then $LHS_{(5)} > RHS_{(5)'}$ so those who produce good papers would produce more papers and publications than individuals producing low quality papers. With the maximum value of θ equal to one, *some* individuals producing high quality papers would produce more papers and publications than they would if they produced low quality papers if $c < 3$. These results suggest that for a high enough level of ability, θ, and a high enough reward for publications in good journals versus publications in bad

journals, α, one would produce more papers and publications focusing on high quality papers than on low quality papers, even though the former are more costly to produce.

Again consider those with the same θ who are employed at institutions with the same values of v and α, where only some are provided the support to produce high quality papers. Would the same individual have more publications in *bad journals* by focusing on low quality papers than high quality papers? One who produces low quality papers has $v(1-\alpha)$ publications in bad journals, and the number published in bad journals if the same person produced high quality papers is $\frac{v(1-\theta)}{c}[\alpha\theta + (1-\alpha)(1-\theta)]$. Focusing on low quality papers would result in more publications in bad journals if:

$$c(1-\alpha) > [1-\theta][\alpha\theta + (1-\alpha)(1-\theta)]. \quad (6)$$

If $\alpha = ½$, $LHS_{(6)} = \frac{c}{2} > RHS_{(6)} = \frac{1-\theta}{2}$, but, if $\alpha = 1$, $LHS_{(6)} = 0 < RHS_{(6)} = \theta(1-\theta)$. Suppose $\alpha = ¾$, so publications in good journals are paid three times as much as are publications in bad journals. If $\alpha = ¾$, $LHS_{(6)} > RHS_{(6)}$ when $c > (1-\theta)(1+2\theta)$. Now $(1-\theta)(1+2\theta)$ is maximized when $\theta = ¼$ so that $(1-\theta)(1+2\theta) = 1.125$. Thus, unless c is very low or α is very high, it is likely that individuals with the same θ, and facing the same v and producing low quality papers would have more publications in bad journals than those who produce high quality papers. If α is very high, there is little reward for publications in low quality journals so few low quality papers would be produced.

Conversely, using equation (2):

$$\frac{\partial n_h}{\partial \alpha} = \frac{v}{c}(2\theta - 1). \quad (7)$$

Thus, at least for those with $\theta > ½$, an increase in α increases the number of high quality papers produced and means more publications in bad and good journals for those who produce high quality papers.

2. *When would individuals choose papers of different qualities?*

We have considered how individuals with the same ability, θ, and with the same payoffs for publication would differ depending on whether they produced high or low quality papers. Now we examine individuals who differ in θ, but face the same α and v, in order to see who would *choose* to produce either high or low quality papers. Using equations (1) – (4), the payoffs from producing high or low quality papers, π_h and π_l respectively are:

$$\pi_h = \frac{v^2[\alpha\theta + (1-\alpha)(1-\theta)]^2}{2c}, \tag{8}$$

$$\pi_l = \frac{v^2(1-\alpha)^2}{2}. \tag{9}$$

Canceling terms and taking the square root of both sides yields equation (10) showing that the payoff to producing high quality papers exceeds that of the production of low quality papers, $\pi_h > \pi_l$, if

$$\theta > \frac{(1-\alpha)(c^{1/2}-1)}{2\alpha-1} \equiv \theta^*. \tag{10}$$

$\text{Lim}_{\alpha\to 1/2}\, \theta^* = \infty$, thus $\theta < \theta^*$ and all would produce low quality papers if good and bad publications were rewarded the same. At the other limit, $\lim_{\alpha\to 1}\, \theta^* = 0$, so that all would produce high quality papers if there were no reward for publications in bad journals.

Two factors have affected scholarship in recent years, particularly in business schools. First, for purposes of accreditation, publications *per se* for each faculty member have become more important suggesting a decrease in α, so that low ability faculty can meet publishing standards established for accreditation purposes. Second, acceptance rates at good journals appear to have declined. In our model, we can interpret the decrease in acceptance rates as an increase in c; it is more costly to produce high quality papers that might be accepted in good journals. Clearly $\frac{\partial\theta^*}{\partial\alpha} < 0$, and $\frac{\partial\theta^*}{\partial c} > 0$ showing that a decrease in α or an increase in c raise θ^*, causing more individuals to focus on low

quality papers that will be published in bad journals. The survey results reported by Omobowale appear to suggest a value of $\alpha \approx ½$ in the universities he studied in Nigeria.

Data

A list of journals showing the aggregate ranking for the last ten years on RePEc was downloaded on December 13, 2015. The list contained 1642 journals and shows the publisher of each journal. The list was reviewed to identify journals or publishers appearing on one of Beall's lists. Thirty-nine journals from eighteen different publishers on the RePEc list are considered predatory in Beall's classification.[6] By their standings in the RePEc aggregate rankings, some of these journals might be considered good quality journals. Six of the predatory journals are ranked at number 500 or better and three are in the top 20% of RePEc journals by the aggregate ranking measure.

After identification of the predatory journals, authors and titles of papers published by each journal in 2015 and appearing on RePEc were pasted into an Excel file on 27 December 2015. Over the next two months each available 2015 issue of each predatory journal was reviewed to identify the affiliations of authors and, in cases of authors on RePEc, the number of publications of the author(s). By the time some journals were reviewed, additional issues of the journal had appeared on RePEc. In such instances the data set was not updated. Thus the data file generally does not include all papers published in 2015 by each journal and journals/publishers that promptly submit issues to RePEc will be overrepresented in the data set.

Since the group of journals is restricted to those listed on RePEc, it should not be considered representative of the population of predatory publishers/journals. An implicit assumption of this study is that any journal listed in Research Papers in Economics is an economics journal. However the titles of many articles suggest that not all authors are economists. One of the characteristics used by Jeffrey Beall to identify a predatory publisher is that the journal is "excessively broad … to attract more articles," [Beall (2015)] thus publications outside the usual scope of economics are not too surprising.

[6] Any journal from a publisher on Beall's list is considered predatory in this study. The criteria used by Beall can be downloaded from https://scholarlyoa.com/publishers/

Due to variations in lags between publication of an issue and its appearance on RePEc, the data set excludes some predatory journals listed on RePEc. Many journals had no 2015 issues on RePEc so the final data set includes twenty-seven journals. Of these twenty-seven journals, the number of 2015 papers from each journal in the data set ranges from one to two hundred and thirty-six for a total of 1284 published papers.

Two characteristics of each author were identified from the initial examination of papers, the country in which the author's university or, infrequently, business is located and whether the author is registered on RePEc. If registered on RePEc, the number of publications listed on RePEc is recorded. There are 2774 authors in the data set. Note that there are individual authors with more than one paper in predatory journals so the total number of authors exceeds the number of individuals. Variations in how an author's name might appear on a paper led us to forgo any attempt to determine the number of different authors in the overall data set. However, we also examine more closely the much smaller subset of RePEc registered authors and readdress this issue. This portion of the data collection process was completed on February 28, 2016.

The next step in the data collection process was to calculate the total number of authors and papers from each country. Two compilation issues arose. Many papers had coauthors from different countries. Letting n represent the number of authors, we assigned $\frac{1}{n}$ share of the authorship to the country of each author. Thus country of the first author and those of subsequent authors are weighted equally. In some instances a single author had affiliations across countries. Letting m represent the number of affiliations, the country associated with each affiliation was assigned $\frac{1}{m}$ share in a single authored paper. A few authors had affiliations in different countries and were coauthors with researchers from other countries. In such cases the country's share for each affiliated institution was $\frac{1}{nm}$.

A surprising and unexpected result is the widespread geographic distribution of authors. Authors from ninety countries are in the data set. Azerbaijan, Benin, Cuba, Ethiopia, Kosovo, Malawi, Malta, New Zealand, Rwanda, and Senegal are each represented by a single author. Table 1 shows the numbers of published papers and authors from the five countries most represented in the data. Contrary to the findings of

Xia et. al for pharmaceutical journals, no country or region dominates publishing in predatory journals on RePEc; the practice is widespread. Eight countries, the five listed in the table plus Pakistan, Kenya, and China account for nearly 50% of all publications in these journals and slightly more than half of all authors.

Table 1: Countries Ordered by Number of Authors and Publications

Country	Number of Papers	Percent of Total	Country	Number of Authors	Percent of Total
Iran	**108**	**8.42%**	**Iran**	**279**	**10.06%**
US	**106**	**8.29**	**US**	**218**	**7.88**
Nigeria	**93**	**7.21**	**Nigeria**	**204**	**7.34**
Turkey	**90**	**7.04**	**Malaysia**	**186**	**6.69**
Malaysia	**73**	**5.68**	**Turkey**	**176**	**6.34**

Again, we wish to emphasize that the data are not from a random sample of predatory journals. Some journals seem to attract most of their papers from authors in small subset of countries. For example, half of the twenty-four authors affiliated with South Korean schools published in a single journal. It may be that once an author learns of an 'easy' publication outlet he/she informs like-minded colleagues so that reputation affects the geographic distribution of submissions.

As noted earlier a characteristic of some predatory journals is their very broad scope often reflected in the name. The *International Journal of Academic Research in Business and Social Sciences* and the *Asian Journal of Empirical Research* are two examples of journals in this data set with very broad topic areas. Thus it may not be surprising that many authors who have publications in the data set are not RePEc registered authors as many are unlikely to be economists. Only 146 authors, slightly more than 5% of the total number of authors in the data set, are registered. RePEc compiles the publications and working papers of each registered author allowing a crude assessment of the experience level of each registered author using the number of publications as a proxy. In particular we would like to know whether most economists publishing in predatory journals are relatively inexperienced with few publications thus, perhaps, somewhat ignorant of publishing standards or starting careers by seeking publication quantity over quality in research output.

Sixty-two registered authors have six or fewer publications listed on RePEc and eleven of these have just one. The number of publications includes the paper in the predatory journal in this data set. These economists might be considered inexperienced at least in terms of publishing. Another forty-seven registered authors have between ten and forty-nine publications. No attempt was made to identify how many of these publications were in predatory journals but the numbers of publications suggest that the authors in this second group have substantial experience in academic research.

The big surprise from the data is that a large number of highly experienced authors also have publications in predatory journals. Sixteen authors of nineteen papers in the predatory journals included in this data set are top 5% authors in RePEc.[7] Each of these top 5% authors has at least fifty publications listed in RePEc and seven have over one hundred. Top 5% authors are dispersed geographically. Three are in Taiwan, three in Australia, and two each work in the US, Germany, and Japan. One each is in Turkey, Pakistan, Mexico, and the Netherlands. Of course highly published researchers will tend to gravitate towards countries with better quality universities hence the lack of seriously underdeveloped economies on the list. Five of the nineteen papers involved a US coauthor in the top 5% in the RePEc rankings.

What might motivate an experienced economist to publish in a predatory journal? One possibility is that an inexperienced coauthor handled the submission and the experienced author was ignorant of the journal's low quality. In most cases it is impossible to reject this hypothesis, but three of the nineteen papers involving top 5% authors are single authored pieces and a fourth has two coauthors both of whom are in the top 5% RePEc so ignorance cannot be the only explanation. Furthermore, one top 5% economist was coauthor on three of the papers in the data set and two others in the 5% group had two coauthored papers. One person in the RePEc top 5% had two single authored articles in predatory journals in the data set. Apparently some of the top 5% authors are aware of the nature of these journals but choose to publish in these outlets regardless of quality.

[7] The names of top 5% are shown in bold font in the author index of RePEc thus allowing easy identification. The name index in RePEc was consulted on April 5, 2016.

For those top 5% authors not being misled by inexperienced coauthors, what would such experienced researchers gain from low quality publications? One possibility is a relatively low value of α at their institutions. As suggested earlier, a low α can benefit a school in two ways. First, it makes it easier for low quality authors to achieve publication standards established for accreditation purposes. Second, a lower α increases the number of publications of an author producing low quality papers increasing both the ranking of individual and that of the affiliated institution. Indeed if those who evaluate a faculty member's annual performance do not examine each publication, rather use an overall RePEc ranking as a measure of performance then a publication in a predatory journal indexed on RePEc will enhance the individual's reward.

Conclusions

Unlike Xia et. al we find that authors of articles in predatory journals are widely dispersed geographically. The papers in our selective data set are from authors in ninety different countries although just eight countries account for about 50% of the papers and authors. The broad subject area of a typical predatory journal, attracting papers from many fields outside economics, may explain why only 146 of the 2774 authors in the data set are registered in RePEc. We view this result as a positive one since it suggests that only a small number of active researchers in economics are publishing in predatory journals.[8] Of course, our sample is not a random one of predatory journals that publish papers on economic topics so further work is required to verify this conjecture.

The inclusion of predatory journals on RePEc is problematic. Indeed some of the predatory journals prominently display the RePEc logo on their web pages in an apparent attempt to claim the journal is of high quality due to its affiliation with RePEc. More troubling is the apparent manipulation of the RePEc rankings through publishing in predatory journals even by economists ranked in the top 5% on RePEc. Although we did not examine the publications of all economists who published in predatory journals in our data set, it seems likely that some who rank outside the top 5% are also using

[8] According to the RePEc website, there are more than 46,000 registered authors. If we regard everyone registered on RePEc as an active researcher, then perhaps 0.3% published in the predatory journals on RePEc in 2016. The list of 146 registered authors in the data set was not screened for duplicates so the actual number of individuals, thus percentage, may be even smaller.

publications in predatory journals to raise their rankings in RePEc. Since only 146 authors of the papers in our data set are registered in RePEc, the problem appears small at the moment but it certainly has the potential to worsen.

References

Beall, J. "Predatory Publishers are Corrupting Open Access." *Nature*, 489, 2012, 179.

Beall, J. "Criteria for Determining Predatory Open Access Publishers." Unpublished document, 3rd edition, 2015. https://scholarlyoa.com/publishers/ Downloaded March 4, 2016.

Bohannon, J. "Who's Afraid of Peer Review?" *Science*, 342, 2013, 60-65.

Butler, D. "The Dark Side of Publishing." *Nature*, 495, 2013, 433-435.

Mazieres, D. and E. Kohler. "Get Me Off Your Fucking Mailing List." Unpublished paper, 2005. Downloaded on May 20, 2016 from https://scholarlyoa.com/2014/11/20/bogus-journal-accepts-profanity-laced-anti-spam-paper/

Omobowale, A.O. "Peripheral Scholarship and the Context of Foreign Paid Publishing in Nigeria." *Current Sociology*, 62, 2014, 666-684.

Shen, C. and B. Björk. "Predatory Open Access: A Longitudinal Study of Article Volumes and Market Characteristics." *BMC Medicine*, 13, 2015, 1-15.

Xia, J. "Predatory Journals and Their Article Publishing Charges." *Learned Publishing*, 28, 2015, 69-74.

Xia, J., J.L. Harmon, K.G. Connolly, R.M. Donnelly, M.R. Anderson, and H.A. Howard. "Who Publishes in 'Predatory' Journals?" *Journal of the Association for Information Science and Technology*, 66 (7), 2015, 1406-1417.

West, J.D., T. Bergstrom, and C.T. Bergstrom. "Cost Effectiveness of Open Access Publications." *Economic Inquiry*, 52 (4), 2014, 1315-1321.

Zimmermann, C. "Academic Rankings with RePEc." Federal Reserve Bank of St. Louis working paper, 2012.