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
Orcid ID: 0000-0001-9892-3492

And

Timothy J. Perri
Department of Economics
Appalachian State University
Boone, North Carolina
perritj@gmail.com

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Abstract: The extent of publishing in predatory journals in economics is examined. A simple model of researcher behavior is presented to explore those factors motivating an academic to publish in predatory journals as defined by Beall (2015). Beall's lists are used to identify predatory journals included in the Research Papers in Economics archives. The affiliations of authors publishing in these outlets indicate that the geographic dispersion of authorship is widespread. A very small subset of authors is registered on RePEc. A surprising number of authors who are in the RePEc top 5% also published in predatory journals in 2015.

Keywords: Predatory journals, Research Papers in Economics, open access

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I. 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 have coincided with, or perhaps fostered, an increased emphasis on scholarly publishing in academia worldwide. Promotion, merit pay, tenure, 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.

Increases in research output and extension of the Internet have been accompanied by an expansion in the number of journals. Compared to traditional print journals, the online, open access journal model is a relatively inexpensive form for publishing scientific work, contributing to the growth in the number of outlets for scholarly communication [see West, Bergstrom, and Bergstrom, 2014, and the citations therein]. Certainly, many open access journals follow the ethical standards established by reputable 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 a discipline are actually accepted for publication.

Regrettably, some open access outlets perform cursory reviews of submissions, with accepted papers published contingent on the authors' payment of a publication fee. Shen and Björk (2015) succinctly describe the process; "(n)ew innovative publishers repositioned themselves as service providers to the authors, publishing with them, rather

than seeing themselves as content providers to readers."[1] Until recently Jeffrey Beall maintained a list of journal publishers, and another list of stand-alone journals that perform little or no review, charge post-acceptance publication fees, and otherwise satisfy his criteria for classification as predatory at the Scholarly Open Access blog (http://scholarlyoa.com/).[2] 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 general problem with publications in predatory journals is that publications are screened poorly, if at all, for the quality of the work; that is, there is little or no peer review. Such publications may describe research that was poorly or incorrectly done; problems that a thorough peer review would likely have revealed. As a consequence, articles in these journals may be cited incorrectly as authoritative; and accrediting bodies and university administrators may wrongly regard such publications as evidence of faculty research productivity.[3]

Using a data set of 1284 articles, we examine the extent of publishing in predatory journals in economics. More specifically, using Beall's lists supplemented by other sources we identify predatory journals indexed in Research Papers in Economics (RePEc, 2015) and determine the geographic distribution of the authors who published in these

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[1] Shen and Björk (2015), p. 1.

[2] More formally he characterizes journals and publishers as "potentially, possibly or probably predatory." Reflecting common usage, we will use the term 'predatory journal' to describe a journal either on his list of stand-alone journals or from a publisher on his publisher list at the time of data collection in late 2015 and early 2016. An attempt was made to consult Beall's lists on January 17, 2017. Although the format of the page remained the same, the lists had disappeared and were replaced with the message "[t]his service is no longer available." The most recent versions of Beall's lists are archived at https://web.archive.org/web/20170112125427/https://scholarlyoa.com/publishers/ and https://web.archive.org/web/20170111172309/https://scholarlyoa.com/individual-journals/.

[3] For example, Pyne mentions an article in a journal from a predatory publisher that is cited as evidence of a conspiracy in the collapse of the World Trade Center Towers on September 11, 2001.

journals in 2015.[4] The first question addressed is whether most authors are affiliated primarily with universities in the developing world as indicated by the findings of Xia *et al*. (2015) for pharmaceutical journals or Shen and Björk (2015) using a sample of journals on Beall's lists. We wonder if the distribution more dispersed in economics.

Following the initial analysis using the data set that includes all authors, RePEc-registered or not, our focus shifts to the characteristics of those authors registered with RePEc. The second research question we address is general: what are the characteristics of economists publishing in predatory journals? More specifically, we want to know whether the geographic distribution of RePEc-registered economists conforms to the results for the larger group of authors. Further, we wish to determine the experience level of economists publishing in such journals. An understanding of the characteristics of economists will allow us to formulate some hypotheses regarding publication incentives in the profession. A simple model of academic publishing provides a theoretical framework for the discussion of the data, and provides insight into the incentives for publishing in predatory journals.

II. LITERATURE

Studies of publishing in open access journals fall into three nonexclusive groups: Stings, case studies, and general studies of author/journal characteristics. Stings focus on identifying online journals that have a cursory, at best, peer review process. 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

[4] All the journals in our data set follow the 'gold' open access model, that is articles are available without charge on the journal's website. Reference to open access herein should be understood to mean the 'gold' model. Graziotin *et al.* (2014) discuss the various open access options.

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 to require 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 having a TR impact factor in which "… hundreds of Serbian scientists published hundreds of articles …in only a couple of years."[5] The journal in question charged 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.

Case studies have examined publishing in predatory journals in Nigeria [Omobowale *et al.* (2014)] and a small business school in Canada [Pyne (2017)]. The case studies emphasize author motivation. Omobowale *et al.* (2014) assert 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. They conduct interviews with thirty faculty members in two public universities to ascertain their views regarding publications in predatory journals. They also interview 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

[5] Djuric (2015), p.184. The portion of Thomson Reuters Corporation that produced impact factors was sold in 2016; Clarivate Analytics now publishes the measures.

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.

Pyne (2017) combines data on salary and author characteristics at a small, Canadian business school with journal quality measures to estimate the gain to an author from publishing in predatory journals. Journal quality is taken from the Australian Business Deans Council (ABDC) ranking. His study is the first attempt at quantifying the benefits of predatory publications. Interestingly a publication in a predatory journal had a negative, but insignificant effect on faculty salary in his study. However, the number of journal publications had a strongly positive, significant effect on salary. Overall, his results appear to suggest that quantity of publications is more important than quality. Curiously, Pyne finds that a publication in one of the highest ranked journals, one classified A* on the ABDC list, has a significant negative effect on salary. He also examines research awards. The number of awards is too small to allow empirical estimation, so he focuses on correlations. He finds a large, positive correlation between receipt of a research reward and publications in unranked (not on ABDC list) predatory journals, suggesting an additional benefit of such publications in the school he studies. Interesting, publications in predatory journals on the ABDC list have a very small and insignificant correlation with research awards.

The more general studies are those of journal or author characteristics unrestricted by geographical considerations. Our work sits in this category. 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 article processing or publishing charge (APC) 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 a few charged more than $200. Xia *et al*. (2015) are interested in the characteristics of authors publishing in predatory journals in the biomedical sciences. 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 biomedical 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). Xia *et al*. compile data on the authors of papers in these three groups of journals in 2013.[6] 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% are from Africa. About 15% of authors in the second group of journals, and less than 5% of PLoS journal articles are by researchers affiliated with universities in these two locations. Xia *et al*. also find that group 1 authors have fewer publications and are cited less than

[6] 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.

group 2 authors, leading to their overall conclusion that the authors of articles in predatory journals are typically inexperienced and from developing countries.

III. THEORETICAL FRAMEWORK

3.1. Introduction

What does a traditional journal do? Expanding on the succinct description of journals as 'content providers to readers' (Shen and Bjork, 2015), 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), in economics and other business fields a submission fee is often required *before* a paper is assessed for quality.[7] Revenue is derived from subscriptions, submission fees, and, perhaps, advertising. 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 (2015), the publisher of a predatory journal 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 journal space to authors.[8] If any screening for article quality takes place, it is often limited, leading to relatively high acceptance rates. An article processing charge is imposed on the author(s) *after* acceptance creating an incentive to accept papers in order to increase revenue.

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[7] An article processing charge (APC), a fee charged by the journal after acceptance of a paper, is uncommon in economics and other business fields. The referee noted that APCs are the norm in open access computer science journals, while traditional journals in the field charge neither a submission fee nor an APC.

[8] Beall's blog cited a particularly egregious case of a paper originally written by Mazières and Kohler (2005), but all blog posts have also disappeared from Beall's website. We thank Nick Sisto for making us aware of the paper. A summary of events may be found at https://en.wikipedia.org/wiki/International_Journal_of_Advanced_Computer_Technology .

Predatory journals are open access so publication costs are relatively low compared to a print journal. The cost of publishing an additional paper online must be very small after the costs of establishing the website are incurred.

We abstract from journal behavior in this paper, instead focusing on the motivation of authors with a simple model. As noted in Section Two, at least for Nigerian faculty, three of the four reasons given for publishing in predatory journals suggest that authors recognize the low quality of predatory journals.

In our model, *papers* are unpublished. Papers become *publications.* Suppose there are two kinds of papers: *high quality* and *low quality*. 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 (predatory) journals.[9] Low quality papers have zero chance of being published in good journals.[10] High quality papers have a probability of 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. With α denoting the weight assigned to a good journal by a

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

[10] There are low quality journals that are not predatory in which many scholars appear to have a high probability of getting an article published. We are aware of one such journal with a published acceptance rate of around 25%, although most of the scholars we know have almost certainty in acceptance of their papers. If the published acceptance rate is accurate, there must be many papers submitted to these journals that are truly low quality. Such journals fall under our category of 'good.'

university, compensation is given by $v[\alpha$ (# of publications in good journals) + (1-α) (# of publications in bad journals)], with ½ ≤ α ≤ 1. It is assumed that publications in good journals are never valued less than publications in bad journals, so ½ ≤ α. If α = ½, all publications would be valued the same. If α = 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.[11] First, consider an individual who produces high quality papers. The individual's objective is:

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

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:

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

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

3.2. 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 eleven), and others do not receive such support. We first consider

[11] One way to justify this assumption is to suppose there is a fixed cost of producing high quality papers, a cost for which a university compensates a professor. For example, summer research support may be taken away if a sufficient number of good journal articles is not produced.

who would produce more papers, which also means more publications since all papers are published by assumption. Using *eqs*. (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 the left hand side (LHS) of (5) exceeds the right hand side (RHS):

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

If α = ½, all publications are valued the same. In this case, the left-hand side of equation (5) is ½ and the right-hand side is $c/2$ so that $LHS_{(5)} < RHS_{(5)}$ and fewer high quality papers are produced than low quality papers by those with the same ability, θ. The survey results reported by Omobowale *et al*. appear to suggest a value of $\alpha \approx$ ½ in the universities they studied in Nigeria. If α = 1 there is no value to low quality papers so $LHS_{(5)} = \theta$ and $RHS_{(5)} = 0$. Without a reward for publications in bad journals, no one would produce low quality papers. The model thus suggests that the institutions employing researchers are complicit, in part, in publishing in predatory journals. Possible reasons for this complicity are addressed below.

Let us also consider the midpoint of the range for α, α = 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, if c < 3, *some* individuals producing high quality papers would produce more papers and publications than they would if they produced low quality papers. These results suggest that for a high enough level of ability, θ, and a sufficiently high weight, α, for publications in good journals versus publications

in bad journals, 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.

3.3. 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, given that one would have the support to produce high quality papers (footnote eleven). Using *eqs*.(1) – (4), the payoffs from producing high or low quality papers, π_h and π_l respectively, are:

$$\pi_h = \frac{v^2[\alpha\theta + (1-\alpha)(1-\theta)]^2}{2c}, \tag{6}$$

$$\pi_l = \frac{v^2(1-\alpha)^2}{2}. \tag{7}$$

Canceling terms and taking the square root of both sides yields *eq*.(10), which shows that the payoff to producing high quality papers exceeds that for low quality papers, $\pi_h > \pi_l$, if:

$$\theta > \frac{(1-\alpha)(c^{1/2}-1)}{2\alpha-1} \equiv \theta^*. \tag{8}$$

Now $\lim_{\alpha \to 1/2} \theta^* = \infty$. Then $\theta < \theta^*$, and all would produce low quality papers if good and bad publications were rewarded the same. At the other extreme, $\lim_{\alpha \to 1} \theta^* = 0$, 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, acceptance rates at good journals appear to have declined.[12] 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* raises θ^*, causing more individuals to focus on low quality papers that will be published in bad journals. Second, for purposes of accreditation, publications *per se* for each faculty member have become more important. The implications of this second factor are addressed with the next question.

3.4. Why might a university reward publications in bad journals?

First, consider the implications of setting $\alpha = 1$, that is not rewarding low quality journal publications. Equation (4) shows that no one would produce low quality papers. With $\alpha = 1$ equation (2) indicates that the number of high quality papers would be $n_h = \frac{v}{c}\theta$, dependent on the ratio of the reward to producing a high quality paper, *v*, to its cost, *c,* and the probability of being published in a good journal, θ. Suppose θ also measures faculty quality relative to all others in the discipline with 1 indicating the highest quality and zero the lowest. Assuming a normal distribution of ability, an average faculty member, θ = ½, would produce $n_h = \frac{v}{2c}$ high quality papers if $\alpha = 1$.

[12] Card and DellaVigna (2013) find that acceptance rates have fallen at the *American Economic Review* (from 13.8% to 8.1%), *Econometrica* (from 27.1% to 8.5%), and the *Journal of Political Economy* (from 13.3% to 4.8%) between 1976-1980 and 2011-2012.

Under at least one accrediting body with which we are familiar, a business school must establish a minimum number of publications that each faculty member has to achieve per period in order to be considered qualified. In addition the school must maintain a minimum number of qualified faculty to maintain accreditation.[13] Suppose the standard is one publication per period, i.e. $n_h = \frac{v}{c}\theta = 1$. For the highest quality faculty (θ = 1), the standard can be met as long as the compensation is sufficient to cover the cost, that is $v \geq c$. For an average quality individual, the compensation must be at least twice the cost to satisfy the standard. More generally, with a standard of one publication per period, the ratio of reward to cost must be at least as great as the inverse of θ, $\frac{v}{c} = \frac{1}{\theta}$. Requiring more publications per period would necessitate even greater rewards to achieve the standard.

For example, suppose the publication standard is one per period and accreditation requires 75% of the faculty to publish regularly. Further suppose that $\theta = \frac{1}{5}$ for the lowest quality faculty member allowing the university to meet the 75% standard. In this case the reward to publishing must be five times greater than the cost, $\frac{v}{c} = 5$.[14] In short if α = 1 so that faculty are not rewarded for low quality publications, satisfying the accreditation standards may require raising the rewards to publishing and be more costly for the university. Since we do observe faculty

[13] We do not wish to direct attention to any specific accreditation body so we have altered the terms used and simplified the requirements to some extent. However, the scenario fits our experiences and those of colleagues in other institutions.

[14] Note that the reward to cost ratio required for the university to meet the standard depends only on the lowest quality faculty member needed to meet the minimum share, not the others. More concretely, 7 of 10 faculty members could have θ = 1, but the eighth having $\theta = \frac{1}{5}$ (with the other two of still lower quality) must be compensated sufficiently for the accreditation standards to be met.

producing low quality papers that are published in predatory journals it appears that some universities have responded, in part, to accreditation standards by moving α towards ½, the lower cost strategy, rather than increasing *v*.

IV. DATA COLLECTION

Research Papers in Economics is a searchable repository for published and unpublished work in economics. A large number of universities, research institutions, government agencies, publishers, and journals submit work to RePEc. Much of this work is downloadable through RePEc. As works are submitted to RePEc they are screened to determine whether the authors are registered on RePEc. This screening produces a list of possible works by an individual. An individual registered on RePEc must affirm authorship of an item before it appears in the individual's profile on RePEc. In addition to serving as an archive, RePEc uses the information on downloads, citations, number of journal pages, and other criteria to produce individual, journal, and institution rankings.

A list of journals showing the aggregate ranking for the last ten years on RePEc was downloaded in December 2015. The list contained 1642 journals and the names of each journal's publisher. This complete list of journals indexed on RePEc was reviewed to identify journals and publishers appearing on one of Beall's lists. Thirty-nine journals from eighteen different publishers indexed on Research Papers in Economics were classified as predatory by Beall.[15] By their standings in the RePEc aggregate rankings, some of these might be considered good journals. Six of the predatory journals were ranked at number 500 or better and three are in the top 20% of RePEc journals by the ten

[15] Any journal from a publisher on Beall's list is considered predatory in this study. A list of journals is shown in Table A1 of the appendix. The criteria used by Beall was downloaded from https://scholarlyoa.com/publishers/ but, as with all other postings on that site, is no longer available online.

year aggregate ranking measure. More explanatory detail on the data collection is reported in Appendix A.

Although the classification criteria were available on his website, Beall's lists have been controversial in part because the use and weighting of the criteria are not publicly explained or described, giving an impression of subjectivity. Consequently we also examined the Directory of Open Access Journals (DOAJ), Cabell's directory, and a list of members of the Open Access Scholarly Publishers Association (OASPA) for further insight into the practices of the thirty-nine journals in the data set.

The DOAJ, OASPA, and Cabell's directory have selection criteria designed to screen out low quality journals. None of the thirty-nine journals in our data set was included in Cabell's directory, nor is any of the publishers in the OASPA.[16] It is unknown whether publishers applied for inclusion in OASPA, or for their journals to be listed in Cabell's directory and were denied, or whether they did not apply. Nine of the thirty-nine journals are included in the DOAJ. Eight of the remaining thirty journals were previously in the DOAJ, seven of these were removed for "suspected editorial misconduct by publisher" and one was removed because the "web site does not work." Twenty-two journals either never applied for inclusion in DOAJ or were excluded in an initial screening. Thus there are only nine journals, less than one quarter of the data set, that the DOAJ considered of acceptable quality and Beall considered predatory. Of these nine, four had no 2015 papers indexed in RePEc at the time of data collection, and hence are excluded from our data set of 2015 publications. Since inclusion of journals in the DOAJ

[16] The use of Cabell's directory for screening journals occurred before Cabell's began to publish a blacklist of journals that violate its behavioral standards. The journals in our data set did not appear in what Cabell's now refers to as the whitelist of journals, i.e. those that satisfy its criteria.

and Cabell's directory appears beneficial to journals by signaling acceptable or better quality to potential authors, the omission of most from these directories suggests that the journals in our data set are indeed of very low quality. The substantial overlap between journals and publishers included on Beall's lists and their exclusion from the DOAJ, Cabell's directory, and the OASPA gives us confidence in using Beall's work to identify disreputable open access journals.

Acceptance rates were not available on the homepages of most of the journals in the data set. Just a third of the thirty-nine journals reported acceptance rates, and these ranged from 5% to 62% in 2015. The six journals that reported rates between 5% and 25% provided no supporting data. Six others showed data on submissions and acceptances on their homepages, allowing calculation of acceptance rates that varied from 39% to 61%. The other journal reported a 62% rate, but no other information was provided.[17]

Due to variations in lags between publication of an issue and its appearance on RePEc, the data set excluded some predatory journals listed on RePEc. Twelve journals had no 2015 issues on RePEc when the data were compiled so the final data set includes twenty-seven predatory journals with publications in 2015; just five of these were listed on DOAJ. 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 in the data set of predatory journals.[18]

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[17] Dates of initial submission and acceptance appear on some published papers that were examined during the course of data collection, and reinforce the notion of less-than-thorough referee reviews by the predatory journals. Many papers that were individually examined had been accepted within a month or less of the initial submission. One paper had been submitted just two days before acceptance. What papers are rejected by these journals? Our conjecture is that some papers are so poorly written in English that they can quickly be rejected after an editor reads a small portion of the paper.

[18] Fifteen of the twenty-seven journals in our data set appear on Cabell's recently published blacklist. The number and nature of the behavioral violations committed by each journal are shown on the blacklist.

V. DATA ANALYSIS

5.1. What is the geographic distribution of the institutions with whom the authors are affiliated?

Two compilation issues arose in determining the geographic distribution of the authors' affiliated institutions. Some papers had coauthors affiliated with institutions in 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, the 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 $\frac{1}{nm}$.

The geographic dispersion of authors is widespread. Authors appearing in the data set are affiliated with institutions in ninety countries. 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. No country or region dominates publishing in predatory journals on RePEc. 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. Four interesting facts regarding predatory publishing arise from the table. First, those countries accounting for the largest shares of all authors and publications are mostly in Asia or Africa as found in Xia *et al*. (2015). Second, notable for its omission is India. Sixty-one authors in Indian institutions account

for just thirty papers in predatory journals indexed in RePEc in 2015. Given its large population and academic sector, more publications in predatory journals might have been expected. Third, Iranian institutions host the largest number of authors and the most predatory journal articles in the data set, a surprising finding given the relatively small size of the country and its educational sector.[19] Finally, authors in institutions in the United States published nearly as many articles in predatory journals as did authors in Iran, giving the US second place in both number of authors and number of publications. Of course, the probability of an author affiliated with a US institution publishing in a predatory journal is smaller than that of an Iran-based researcher given the larger US academic sector. Nonetheless the prominent position of US institutions in the data set suggests that publication in predatory outlets is not primarily a developing world phenomenon.

[19] A colleague wondered whether bias might exclude Iranian academics from authorship in reputable journals restricting them to publishing in predatory outlets. Although we are skeptical of this conjecture, it cannot be rejected by the data.

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**

Some journals seem to attract most of their papers from authors in a small subset of countries. For example, half of the twenty-four authors affiliated with South Korean universities published in a single journal. An obvious conjecture is 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.

5.2. Do RePEc registered authors figure prominently in the data set?

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 whose names suggest 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 since many are unlikely to be economists. Only 124 individual authors, about 5% of the total number of authors in the data set, are registered with RePEc. RePEc registered individuals are authors or coauthors of 148 papers, almost 12% of the 1284 published papers in the data set. The subset of registered authors is a much richer source of information, however, and allows us to draw conclusions regarding the experience level of authors using the publication records available in RePEc.

In addition to the name and country of affiliation, for each registered author we also obtain the total number of publications, the number of publications in predatory journals, the date of the first publication, and whether RePEc ranks the author in the top 5%.[20] Nineteen of the twenty-seven predatory journals with 2015 publications in the data set had a least one paper authored or co-authored by a researcher registered on RePEc.

[20] Data collection for the subset of registered authors began on July 9 and ended on July 25, 2016. Each author's publications appearing on RePEc were reviewed to collect the additional information on

The data subset contains information on 124 registered authors with 148 publications in predatory journals in 2015. These authors have a total of 3015 published papers, a mean of 24 publications per author, with 310 of these, slightly more than 10%, in predatory journals. Although most papers are co-authored, the majority of publications have just one RePEc-registered author. A few authors have more than one 2015 publication in the data set. One registered author has four published papers in 2015 in our data set of predatory journals, and four others have three publications. Twenty-seven of the 124 registered authors are top 5% authors in RePEc. Thus nearly 22% of the subset of registered authors who published in a predatory journal in 2015 are top 5% authors according to RePEc criteria.

One top 5% author has just eleven publications, eight of which are in predatory journals. Another has thirteen published papers with five of these in predatory journals. Several other authors have achieved the top 5% ranking, yet appear to have an insufficient number of publications in high quality journals to justify the rank. RePEc rankings depend on citations, impact factors, and other criteria [see Zimmerman, 2015]. We do not explore the curious fact that authors with relatively few publications in lower quality journals have achieved the top 5% ranking in this paper, but simply conjecture that either some authors, predatory journals, or both are 'gaming' the rankings.

Ten registered authors have just one published paper, the one in the predatory journal. Forty-six registered authors have between two and six total publications, and thirteen have between seven and ten published papers. Seventeen authors have more than

publications. A count was made of the number of publications in predatory journals for each individual, regardless of the date. Thus the number of papers published in predatory journals includes those from 2015 as well as publications prior to 2015 and some in 2016.

50 total publications, and eight of these have more than 100 published papers. Every registered author with more than 50 publications is a top 5% author. One top 5% author has sixteen publications listed in predatory journals in the RePEc data; no other registered author in the data set has more than nine. The 124 authors have a median of eight publications, with a median of two published papers in predatory journals, suggesting that predatory journals are important outlets for the research output of the typical RePEc registered author.

5.3. What is the geographic distribution and experience level of RePEc registered authors with publications in the data set?

Authors registered with RePEc are affiliated with institutions in 35 different countries reflecting the geographic dispersion found in the data set for all authors. Table 2 shows the number of registered authors by country affiliation for the top eight countries. Slightly more than half of all registered authors in our data set are from these eight countries. As with the full data set of all authors, the US, Turkey, Nigeria, and Malaysia are four of the countries having the most registered authors with publications in predatory journals. Every continent except Antarctica and South America is represented in the data on registered authors.

TABLE 2

Countries of Institutions with the Most Registered Authors

Country	Number of registered authors
US	12
Turkey	11
India	9
UK	7
Pakistan	7
Nigeria	7
Italy	6
Malaysia	6
Total	65

The date of the first publication allows a rough assessment of the research experience of each registered author. In particular we would like to know whether most economists publishing in predatory journals are relatively inexperienced. Inexperienced authors may be ignorant of publishing standards, or they may seek publication quantity over quality in research output. The median period for the first publication is 2009-2010. Thus half of the authors have 6+ years of experience since their first published paper. If the trajectory of the median author follows that of a typical faculty member in an economics or other department in a US business school, and, assuming the first published paper occurred not long after finishing the Ph.D., he/she would be applying for tenure and promotion to associate or have recently been considered.[21] The 2009-2010 median date suggests that at least 50% of the authors have substantial research experience. Twenty-three of the registered authors had their first published paper before 2000, and thus can be regarded as very experienced researchers.[22]

At least for our data set, it does not appear that most economists publishing in predatory journals tend to be inexperienced. Furthermore, the simple correlation between the date of the first publication and the number of published papers in predatory journals is -.022 suggesting that ignorance of publishing standards due to inexperience is not the primary reason authors publish in predatory journals. Finally, there is a correlation of .303 (p value = .001) between the number of total publications and the number of publications in predatory journals. Although it might be expected that authors with more publications also have more publications in predatory journals, the positive correlation

[21] We assume that most registered authors have doctorates. The referee noted that standards for obtaining a Ph.D differ across fields; in some disciplines one or more publications is a requirement of graduation.
[22] Alternatively the number of publications could be used as a proxy for research experience. Twenty-one registered authors have more than forty published papers, a group we regard as highly experienced.

also suggests that registered authors do not become less likely to target predatory publication outlets as they gain experience in publishing. This impression is reinforced by a correlation of .255 (p value = .004) between publications in predatory journals and those in non-predatory journals. This correlation supports the analysis in subsection 3.2 suggesting that those with low ability (θ) who focus on low quality papers have more total publications than those who produce high quality papers when there is a greater reward for publications in bad journals (a value of α closer to ½), and when the cost (c) of producing high quality papers publishable in good journals is large.

A surprise from the data is the large number of highly experienced authors with publications in predatory journals. As previously noted, twenty-seven registered authors are top 5% authors in RePEc. These top 5% authors have 2120 total publications, a mean of 79 publications per author, of which 104, or 4.9%, are in predatory journals. The top 5% authors have published less frequently in predatory journals than the all-registered authors group that, as previously noted, had about 10% of their papers in predatory journals. Top 5% authors are also dispersed geographically. Institutions in Taiwan, Australia, and the US each account for three of the top 5% authors. Two each work in Germany, Italy, Japan, Pakistan, and Turkey. Eight other countries have one top 5% author.

5.4. What might motivate an economist in the top 5% of RePEc 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 ten of the thirty-one papers published by top 5%

authors in predatory journals in 2015 are single authored pieces, and another has two coauthors, both of whom are in the top 5% of RePEc, so ignorance cannot be the only explanation. Furthermore, one top 5% economist was a coauthor on three of the papers published in predatory journals in the data set of 2015 publications, and six others in the 5% group had two coauthored papers in predatory journals. Apparently at least some of the top 5% authors are aware of the nature of these journals, but choose to publish in these outlets regardless of their low quality.

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 some RePEc scores of the individual and of the affiliated institution. Indeed if those who evaluate a faculty member's annual performance do not examine each publication, and instead use an overall RePEc ranking as a measure of performance, then a publication in a predatory journal indexed on RePEc may enhance the individual's reward. Among the twenty-seven top 5% authors, there is a correlation of .336 (p value = .087) between the number of predatory publications and the date of the first publication, meaning that more experienced top 5% authors (those with earlier dates for the first publication) tend to have fewer predatory publications. The positive correlation may mean that younger top 5% authors have elected to pursue publications in predatory journals in part to boost their RePEc rankings. Unlike the results for all registered authors, the correlation between the

numbers of publications in predatory journals and published papers in non-predatory journals is just .087, suggesting that those ranked in the top 5% are neither more nor less likely to publish in predatory outlets as they gain further experience.

VI. CONCLUSIONS

The authors of articles in predatory journals indexed in RePEc 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 124 of all authors in the data set are registered in RePEc. We view this result as a positive one since it suggests that not too many active researchers in economics are publishing in predatory journals. 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, or report their RePEc impact factors in an apparent attempt to signal high quality by their affiliation with RePEc. Also troubling is the apparent manipulation of the RePEc rankings through publishing in predatory journals even by economists ranked in the top 5% on RePEc. Since only 124 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 unless the employing institutions remove the incentives for publishing in predatory journals. RePEc

can also contribute by establishing minimum quality criteria to be met by journals indexed in its archives.[23]

[23] To their credit, those who manage RePEc are aware of these issues and taking steps to address them. A recent post on the RePEc blog requests a volunteer to head a committee on journal quality.

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Appendix A: Data Collection

A list of journals showing the RePEc aggregate ranking for the last ten years was downloaded on December 13, 2015. The list contained 1642 journals and the identities of each journal's publisher. The RePEc list was reviewed to find journals or publishers appearing on Beall's lists of predatory publishers or journals. Thirty-nine journals from eighteen different publishers on the RePEc list are considered predatory in Beall's classification. The journals are listed in Table A1.

In response to comments regarding the alleged subjectivity of Beall's lists, we searched in the DOAJ, OASPA, and Cabell's directory for those journals/publishers indexed in RePEc and appearing on Beall's lists. None of the predatory journals are in Cabell's, and none of the publishers are members of the OASPA. Nine of the thirty-nine journals in our data set have passed muster by DOAJ acceptance criteria and remain in the directory. As noted in the main body of the paper, eight other predatory journals in our data set were originally in the DOAJ but were removed for failing to adhere to DOAJ standards.

After identification of the predatory journals, authors and titles of papers published in each journal in 2015 and appearing on RePEc were pasted into an Excel file on December 27, 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 registered on RePEc, other characteristics of their publication records. By the time some journals were reviewed, additional issues of the journal had appeared on RePEc. In such instances the new information was not incorporated into the data set. 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 compared to those that delay their submissions.

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. Twelve journals had no 2015 issues on RePEc when the data were compiled, so the final data set includes twenty-seven predatory journals with publications in 2015. Of these twenty-seven journals, the number of 2015 papers from each journal ranges from one to two hundred and thirty-six for a total of 1284 published papers in predatory journals.

We began this study with an implicit assumption that a journal listed in Research Papers in Economics is an economics journal. However, the titles of many articles and journals 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 published papers outside the usual scope of economics do appear in the data set.

Two characteristics of each author were identified from the initial examination of papers: the country in which the author's affiliated institution is located, and whether the author is registered on RePEc. If registered, the number of each author's publications appearing on RePEc is recorded. There are 2774 authors in the data set. Note that there are individual authors with more than one paper in the data set for 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.

Data collection for the subset of registered authors began on July 9 and ended on July 25, 2016. Each author's RePEc publications were reviewed to collect the additional information on publications. Counts were made of the number of publications in predatory journals for each individual, and of total journal publications.

Table A1-Predatory Journals Indexed on RePEc-December 13, 2015

Journal	RePEc Rank[a]	In DOAJ?[b]
Applied Economics and Finance	1481	No*
Asian Economic and Financial Review	250	No
Business and Economic Research	1457	No
Economy & Business Journal	1517	No
International Journal of Academic Research in Accounting, Finance, and Mgt. Sciences	383	No
International Journal of Academic Research in Business and Social Sciences	296	No*
International Journal of Academic Research in Progressive Education and Development	1473	No
International Journal of Asian Social Science	301	No
International Journal of Business Administration	1397	No*
International Journal of Economics and Empirical Research	854	No
International Journal of Economics and Financial Issues	464	Yes
International Journal of Energy Economics and Policy	517	Yes
International Journal of English Language and Literature Studies	1236	No
International Journal of Financial Research	1192	No*
International Journal of Social Science Research	1186	No
International Journal of Social Science Studies	1431	No*
International Review of Management and Marketing	1125	Yes
Journal of Asian Business Strategy	1290	No
Journal of Asian Scientific Research	910	No
Journal of Economic and Financial Studies	1417	Yes
Journal of Management and Strategy	1430	No*
Journal of Reviews on Global Economics	1066	No
Journal of Social Science Studies	1607	No
Research in World Economy	1146	No*
Review of Business and Finance Studies	1559	No
Review of Economics & Finance	500	Yes
The International Journal of Business and Finance Research	961	No
The following journals were indexed in RePEc but had no 2015 publications		
Accounting and Taxation	1344	No
Asian Journal of Agriculture and Rural Development	1080	Yes
Asian Journal of Empirical Research	689	No

Indexed in RePEc but without 2015 publications, continued		
Business Education and Accreditation	1573	No
E3 Journal of Business Mgt. and Economics	993	No
Far East Journal of Psychology and Business	641	No**
Global Journal of Business Research	1093	No
International Journal of Agricultural Mgt. and Development	1275	Yes
International Journal of Management and Sustainability	1222	No
International Journal of Mgt. and Marketing Research	1463	No
Journal of Economics and Political Economy	1315	Yes
Journal of Knowledge Management, Economics and Information Technology	793	Yes

[a] Journal aggregate ranking for the last ten years in Research Papers in Economics on December 13, 2015.

[b] The Directory of Open Access Journals was consulted on January 9, 2017.

* Removed from DOAJ before January 9, 2017 for "suspected editorial misconduct by publisher." (DOAJ)

** Removed from DOAJ before January 9, 2017 because "web site does not work." (DOAJ)