Economists behaving badly: Publications in predatory journals

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Publications in Predatory Journals

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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 used to identify predatory journals and publishers included in the Research Papers in Economics archives. Once identified, the affiliations of authors publishing in these outlets are determined in order to identify the characteristics of those publishing in predatory journals. The geographic dispersion of authorship is widespread. A very small subset of authors is registered on RePEc. Around forty-five percent of registered authors who publish in predatory journals in the data set have six or fewer publications. A surprising number of authors who are in the RePEc top 5% also published in predatory journals in 2015.

1. 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.

The increase in research output and extension of the Internet have 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, many open access journals follow the ethical standards and practices one expects from 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 substantial 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] Jeffrey Beall maintains 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/). 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.[2] A simple theoretical model of academic publishing is constructed to better understand the motivation for publishing in predatory journals. Beall's lists are then 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 might expect that most publications in predatory journals will be from inexperienced 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. This expectation is incorrect; authors publishing in the predatory journals listed on RePEc are geographically disbursed.

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[1] Shen and Björk (2015), p. 1.
[2] 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 in journals published by a company on Beall's list of predatory publishers.

Following the initial analysis, the focus shifts to the characteristics of RePEc registered authors in the larger data set. Although the subset of registered authors is much smaller, much more information can be gleaned from RePEc sources regarding the publication practices of this group of researchers.

2. 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 having a TR impact factor in which "… hundreds of Serbian scientists published hundreds of articles …in only a couple of years."[3] 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.

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

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[3] Djuric (2015), p.184.

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 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). Xia *et al*. compile data on the authors of papers in these three groups of journals in 2013.[4] 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 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. However, as discussed the data section, there are many authors publishing in predatory journals listed on RePEc who are neither inexperienced nor from developing countries.

3. Theory

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

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[4] 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.

author(s), a submission fee is often required *before* a paper is assessed for quality. 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 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.[5] If any screening for article quality takes place, it is limited, implying 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. 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. 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 $c > 1$.

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[5] 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/. We thank Nick Sisto for making us aware of this paper.

All papers have a 100% chance of being published in bad (predatory) journals.[6] Low quality papers have zero chance of being published in good journals.[7] 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. 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 that publications in good journals are never valued less than publications in bad journals, so ½ $\leq \alpha$. 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.[8] First, consider an individual who produces high quality papers. The individual's objective is:

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

We then have:

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

[7] 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%. If most of the scholars we know have almost certainty in acceptance, then there must be many papers submitted to these journals that are truly low quality assuming accuracy of the acceptance rate. Such journals fall under our category of "good."

[8] One way to justify this assumption is if 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.

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

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

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

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

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 eight), and others do not receive such support. We first consider 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:

$$\alpha\theta + (1-\alpha)(1-\theta) > c(1-\alpha). \tag{5}$$

If $\alpha = \frac{1}{2}$, all publications are valued the same so $LHS_{(5)} = \frac{1}{2} < RHS_{(5)} = c/2$. 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, when $\alpha = \frac{1}{2}$, 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. The survey results reported by Omobowale appear to suggest a value of $\alpha \approx \frac{1}{2}$ in the universities he studied in Nigeria. If $\alpha = 1$ there is no value to low quality papers so $LHS_{(5)} = \theta$ and $RHS_{(5)} = 0$. Without 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. We address possible reasons for this complicity later in the paper.

Let us also consider the midpoint of the range for α, $\alpha = \frac{3}{4}$. Then $LHS_{(5)} = \frac{1}{4} + \frac{\theta}{2}$, 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 and $c < 3$, *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 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:

$$c(1-\alpha) > [1-\theta][\alpha\theta + (1-\alpha)(1-\theta)]. \tag{6}$$

If $\alpha = \frac{1}{2}$, $LHS_{(6)} = \frac{c}{2} > RHS_{(6)} = \frac{1-\theta}{2}$, but, if $\alpha = 1$, $LHS_{(6)} = 0 < RHS_{(6)} = \theta(1-\theta)$. Suppose $\alpha = \frac{3}{4}$, so publications in good journals are rewarded three times as much as are publications in bad journals. If $\alpha = \frac{3}{4}$, $LHS_{(6)} > RHS_{(6)}$ when $c > (1-\theta)(1+2\theta)$. Now $(1-\theta)(1+2\theta)$ is maximized when $\theta = \frac{1}{4}$ and $(1-\theta)(1+2\theta) = 1.125$. Thus, unless c is very low or α is very high, it is likely that individuals with the same θ, 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):

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

Thus, at least for those with $\theta > \frac{1}{2}$, 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.

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 eight). Using *eqs.*(1) − (4), the payoffs from producing high or low quality papers, π_h and π_l respectively, are:

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

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

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:

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

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, 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.[9] 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.

4. 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 the names of each journal's publisher. 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.[10] By their standings

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[9] 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.

[10] Again, 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/

in the RePEc aggregate rankings, some of these journals might be considered good 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.

Acceptance rates are not available on the homepage for most of the journals in the data set. Just a third of the thirty-nine journals report acceptance rates, and these range from 5% to 62% for 2015. The six journals that report rates between 5% and 25% provide no supporting data. Six others show data on submissions and acceptances on their homepages allowing calculation of acceptance rates that range from 39% to 61%. The other journal reports a 62% rate but no other data are provided. [11]

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 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, 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 compared to those that delay their RePEc submissions.

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[11] 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.

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), and thus published papers outside the usual scope of economics do appear in the data set.

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 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 in the data set ranges from one to two hundred and thirty-six for a total of 1284 published papers in predatory journals.

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 on RePEc, the number of each registered 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.

The next step was to calculate the total number of authors and papers from each country. Two compilation issues arose. Many 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 $\frac{1}{nm}$.

A surprising and unexpected result is the widespread geographic distribution of authors. 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. Contrary to the findings of Xia *et al.* (2015) for pharmaceutical journals, no country or region appears to dominate 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, it should be emphasized that the data are not from a random sample of predatory journals. 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.

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 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, more than 11% of the 1284 published papers in the data set.

Using RePEc data, we compile additional information on the subset of registered authors. 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%.[12] Registered authors published in eighteen of the twenty-seven predatory journals with 2015 publications in the data set.

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.[13] 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.

One top 5% author has eleven total 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 have

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

[13] Publications in non-predatory outlets are not necessarily journals in the RePEc database. Official reports, for example, are treated as publications. Separating papers in journals from others that RePEc also considers publications would have been a difficult and subjective task. Thus we refer to any paper shown as a publication in RePEc as a journal publication. Note that books and book chapters appear in separate categories in RePEc, so our data do not include these items.

achieved the top 5% ranking in this paper, but simply conjecture that either some authors or 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 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 total publications, with a median of two published papers in predatory journals, suggesting that predatory journal publications are important for the typical author.

Authors 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 eight countries with the most registered authors. 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
Totals	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, and thus, perhaps, are somewhat ignorant of publishing standards, or are starting careers by seeking publication quantity over quality in research output. The median period for the first publication is 2009-2010. Thus half 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 a US university, 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.[14] 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 might be regarded as very experienced researchers.[15]

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[14] We assume that most registered authors have doctorates.

[15] 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.

Thus 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 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 also suggests that registered authors are 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 between publications in predatory journals and those in non-predatory journals. This correlation reinforces 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 ($1-\alpha$), and when the cost (c) of producing high quality papers that could be published in good journals is large.

The 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. 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.

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 ten of the thirty-one papers published by top 5% authors in predatory journals in 2015 are single authored pieces, and another has two co-authors, both of whom are in the top 5% 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 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 both the RePEc ranking of the individual and that 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 will enhance the individual's reward. Among the

twenty-seven top 5% authors, there is a correlation of .336 between the number of

predatory publications and the date of the first publication, meaning that more

experienced top 5% authors (those with earlier first publication dates) 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

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 select

predatory outlets.

5. Conclusions

Unlike the results found by Xia *et al.* (2015) for pharmaceutical journals, we find

that 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 only a small number

of 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 due to the 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. 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. Although the task appears challenging, RePEc can also contribute by establishing minimum quality criteria to be met by journals indexed in its archives.[16]

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[16] 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 chair a committee on journal quality.

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