The Rewards of Predatory Publications at a Small Business School

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This study is the first to compare the rewards of publishing in predatory journals with the rewards of publishing in traditional journals. It finds that the majority of faculty with research responsibilities at a small Canadian business school have publications in predatory journals. In terms of financial compensation, these publications produce greater rewards than many non-predatory journal publications. Publications in predatory journals are also positively correlated with receiving internal research awards. By improving the understanding of the incentives to publish in predatory journals, this research aims to contribute to a better-informed debate on policies dealing with predatory journals.

Keywords: research incentives, predatory journals, awards

INTRODUCTION

Jeffrey Beall coined the term 'predatory publisher' in 2010.[1] Basically, predatory journals are journals that claim to be refereed but in reality publish articles in exchange for the payment of fees by authors. Beall and others have highlighted the negative aspects of predatory journals.[2] Many point out that readers may wrongly believe such publications are legitimate scientific journals. For example, 9/11 conspiracy theorists routinely cite an article in a predatory journal as evidence in support of their views.[3] Other such journals contain articles that support pseudoscience.[4] One even contains a study of ancient Martian management practices.[5]

When academics publish in these journals, their university affiliations contribute to the credibility of the journals. Because decision makers and the public may lack the expertise to distinguish between nonsense and legitimate research, they may be led to suspect expert opinion in general. In addition, when academics are rewarded for publishing in predatory journals, the research incentives of their universities are distorted.

Questions have been raised as to whether authors are innocent victims or knowing participants in predatory publishing. Therefore Ray makes the distinction between predatory publishing, where authors are ignorant of the nature of the journal, and fraudulent publishing, where authors are informed participants.[6] As it is impossible to know the state of mind of authors from analysing their publication records, this study adopts the existing term 'predatory publisher' for both possibilities.

The number of predatory publishers has grown rapidly, which has led to several denunciations.[7] However, without understanding the incentives to publish in predatory journals, it is difficult to know what action should be taken. Examining a school with a significant volume of faculty publications in predatory journals, as well as the incentives involved, can inform the debate over predatory publishing.

This paper investigates rewards for research in a small business school at a relatively new university. It is the first study to distinguish research output in traditional journals from research output in predatory journals. Following a description of the study setting and a review of the literature, the paper examines a range of descriptive statistics using publicly available data on faculty publications and salaries. By demonstrating that the majority of economics and business faculty with research responsibilities have predatory publications (many with multiple predatory publications), this case study provides evidence of the incentives to publish in predatory journals. And, contrary to previous research, it finds that inexperienced faculty are not necessarily the only ones who publish in predatory journals. In addition to this principal finding, a few other observations are made, including limited evidence of the effects of predatory journal publications on being hired, receiving tenure and promotion, and getting an internal research award.

SETTING FOR THE STUDY

The setting for this study is the business school of a Canadian institution that attained university status after 2000. Both the institution and the school have sought accreditation with European and American bodies. Although it is a young university, it has been ambitious in its bids to attain greater status. Examining the research incentives of its business and economics faculty makes for an interesting case study that may offer lessons for other universities.[8]

Although the academic goals of the university leadership are ambitious, this does not necessary imply that its administrators have traditional academic backgrounds. Those in the dean's office of the business school have a very limited background in research, and that research does not exclude predatory publications. The university does not have merit pay for research success, but publications affect compensation in several ways:

1. through initial academic rank and placement of individuals on the salary grid;
2. through the speed at which individuals are promoted and thus pass the salary ceiling for their existing rank; and
3. by the opportunity cost of time spent on research in lieu of earning opportunities.

The first two considerations imply a positive relationship between publication success and compensation, while the third implies a negative relationship. Internally there are three main alternative uses to time spent on research: open-learning teaching, overseas teaching, and internal face-to-face overload teaching.

Distance courses offered by the university are administered separately, but delivering them has become a popular source of supplemental income for faculty. The business school has partnerships with other universities. Particularly pertinent are two partnerships with universities in China, which require faculty willing to teach extra courses over the Christmas holidays and for a few weeks over summer each year. There is also the standard overload teaching that is available at other universities. These alternative sources of income are significant. In most years, the top-earning employee at the university is not the president but rather a senior lecturer in the business school.

The university's business and economics school is divided into four academic departments and one administrative department, the dean's office. The academic departments are 1) accounting and finance, which also includes business law faculty; 2) economics; 3) management, which includes faculty in all disciplines not included in other departments; and 4) marketing, international business, and entrepreneurship (henceforth abbreviated as marketing).

The school uses the Australian Business Deans Council (ABDC) ranking[9] as the *de facto* journal-ranking authority. The dean's written responses

to annual professional development reports often summarize publications in terms of the ABDC rank and encourage faculty to publish in higher-ranked journals. In addition, when publication successes are reported at faculty council meetings, the ABDC rank of the journal is included. When members publish papers in some departments (e.g., economics), the chair sends an email to the department and dean with the ABDC rank of the journal. Although official department and university standards documents antedate the adoption of the ABDC list, tenure and/or promotion applications typically include the ABCD rank of publications.

The ABDC ranking is determined by panels of academics in Australia and New Zealand who are experts in their disciplines. Thus it is a ranking based on expert opinion rather than on bibliometrics alone. Journals included in the ranking are assigned to one of four categories.[10] The top 5 to 7 per cent of journals are assigned to category A*. The remaining journals are assigned to categories A, B, or C.

LITERATURE REVIEW

Several articles have examined the relationship between journal publications and faculty compensation. For example, Sen, Ariizumi, and DeSousa studied the relationship between the research productivity of economics faculty in Ontario universities and their salaries.[11] Contrary to the present study, they found that publications in top journals were positively correlated with salary increments but that publications in lower-ranked journals were not related to salaries.

Gibson, Anderson, and Tressler tried to determine which economics journal rankings best explained salaries in the University of California system.[12] One focus of their paper was the extent to which publications in lower-ranked journals were discounted. The question of whether publications in higher-ranked journals might result in lower compensation never arose in their study.

Using data from the University of California system, Gibson found that, holding total quality-adjusted pages constant, authors had an incentive to publish multiple shorter articles rather than fewer longer articles.[13] Gibson, Anderson, and Tressler found that the number of quality-adjusted publications was a better predictor of salaries than citations.[14] Hamermesh and Pfann reported similar findings.[15] Liebowitz found that common reward schemes did not sufficiently prorate jointly authored works and that this led to excessive co-authoring in economics.[16]

Notably, these articles used data from established universities. The question of whether the findings extend to younger universities remains an open question. Moreover, these studies found that publications in the highest-ranked journals increased salaries, but none of them controlled for publications in predatory journals, a categorical distinction that the present study makes as part of its design.

There is a growing literature on predatory journals because such journals constitute a burgeoning segment of scholarly publishing today. Generally, the literature on predatory publishing takes academic librarian Jeffrey Beall's listing of predatory publishers and stand-alone journals as a starting point.[17] Beall's list focuses on open access predatory journals. His six pages of criteria for evaluating journals largely relate to dishonest practices. Examples include not conducting 'a bona fide peer review,' copying or mimicking journal titles from other publishers, identifying the publisher's owner as the editor of each and every journal published by the organization, not identifying a specific person as the editor, two or more of the publisher's journals having duplicate editorial boards, and the publisher falsely claiming to have an ISI impact factor or purchasing 'fake impact factors' services.[18] Publishers who believe they have been wrongly included can apply to a four-person appeal panel for removal.[19]

There are undoubtedly journals that do not get listed by Beall because they are behind pay walls. However, even limited to those on Beall's list, the growth in predatory publishing has been startling. Shen and Bjork estimated that, in 2014, 420,000 articles were published in approximately 8000 active predatory journals.[20]

Bohannon conducted a 'sting operation' by submitting a scientifically flawed paper to 304 open access journals, some on Beall's list. Eighty-two per cent of the journals on Beall's list accepted the paper; thus he concluded that 'Beall is good at spotting publishers with poor quality control.'[21] Others, including journalists, have conducted similar sting operations. For example, an *Ottawa Citizen* journalist submitted a paper composed of nonsense to eighteen suspected predatory journals.[22] Only two journals rejected the article (for plagiarism), and one of the two offered to publish it anyway if changes were made. Djuric (2015) discussed several related examples from the history of science.[23] One paper accepted by a predatory journal simply contained the single sentence 'Get me off your fucking mailing list' repeated 863 times.[24]

Ray argues that predatory journals may be able to screen for hoax articles. Thus, her approach was to submit essays written by eighth- and tenth-grade secondary school students to ten open access journals. Of the nine who responded with an editorial decision, six accepted the paper without revisions, and only one rejected the paper. The paper was rejected for being too short, but the journal suggested to the author that it be expanded and resubmitted.

Ray summarizes an internal audit by librarians at her institution of publications by faculty in the college of business. The librarians had some concerns about 20.4 per cent of the publications and serious concerns about 6.8 per cent of the publications. As the current research finds similar percentages of suspect publications at the university studied, this similarity implies that the findings herein may apply to other business schools.

Xia et al. found that authors who publish in predatory journals were inexperienced in the sense that they had few prior publications or citations.[25] However, Xia et al. did not control for university quality. Nwagwu and Ojemeni,[26] Shen and Bjork,[27] and Xia et al.[28] all found that many authors of predatory journal articles were from developing countries. Moosa argues that 'the ABDC list encourages rent-seeking and arbitrage whereby a researcher goes for the lowest-quality journal within each bucket or moves to another bucket.'[29]

The most obvious way that the present study contributes to this literature is by quantifying rewards for publishing in predatory journals. Previous work has concluded that inexperienced authors are more likely to publish in predatory journals. However, this work may have overlooked the increased likelihood of such authors working at universities that are more accepting of predatory publications. By considering only those employed by a single university, the present study is better able to consider the relationship between experience and predatory publications. Its focus on authors from a developed country is also rare. Moreover, this article is unique in finding that publications in highly ranked journals may result in negative financial rewards, presumably because the time necessary for such publications takes away from extra earning opportunities. Examining the relationship between publications and research awards is a novel contribution of this study. Finally, the paper provides evidence in support of Moosa's criticisms of bucket classifications of journals and evidence consistent with Liebowitz's argument about excessive co-authoring.

METHOD

At different times, both the author and his research assistant independently searched for each faculty member's publications in the four academic departments and the dean's office of the university's business and economics school. (Dean's office administrative faculty were excluded from the departmental analysis because only one member of the office had a publication.) These searches included all persons listed on departmental webpages in the fall term of 2015, with the exception of adjunct faculty unless the adjunct faculty were recently retired tenured faculty and hence included in the salary data.[30] These searches were thought to have fewer biases than surveying faculty, as faculty with predatory publications may be reluctant to acknowledge them or be disinclined to respond to a survey.

Searches were done using Google Scholar and regular Google. Checks were also made of Google Scholar profiles, ResearchGate profiles, faculty profiles on departmental webpages, online faculty resumes, the university library's search engine, and the university's general website search engine. To have a common cut-off for all individuals, only articles with a publication date of 2015 or earlier were included.

Any list such as Beall's will have both type I errors (journals being wrongly included) and type II errors (journals being wrongly excluded). However, for this research, Beall's focus on open access journals also creates an additional potential bias. Other publishers may follow similar practices but be protected from scrutiny by pay walls.[31] Thus relying on Beall's list may result in undercounting of articles in journals with predatory practices.

Another potential bias relates to the inconsistent archives kept by predatory journals. This problem can be illustrated by an example. After we collected the data, a faculty member asked to see the spreadsheet we had created for him. He was surprised by the omission of a publication a co-author had submitted years ago to a predatory journal without his permission. Although the journal still exists and is on Beall's list, it has not maintained online archives for early volumes. As neither this researcher nor his co-author includes the article in his online profile or CV, it was impossible to verify. If others have published in predatory journals that do not archive old issues, articles in predatory journals will be undercounted.

Most of the compensation data were obtained from a report for the 2014–15 fiscal year made to the university's board of governors meeting of 25 September 2015. Six observations for tenure-track faculty were missing, but these were provided in response to a request to the university's finance department. Eight individuals had not been employed by the university for the entire fiscal year and needed to have their salaries prorated. The university would not provide exact start dates, citing confidentially concerns. Thus it was assumed that, as is normally true, the start dates were July 1 and January 1.

RESULTS

Publications Broken Down by Department

Table 1 provides descriptive statistics of publications for each department. All full-time research faculty are included in these statistics, as well as others who have publications. Included are 496 journal articles that are, or claim to be, refereed. Book reviews, teaching case studies (popular among business faculty), other teaching materials (e.g., test banks), encyclopedia entries, conference proceedings, and industry magazine pieces are not included. These publications were excluded because journal articles are the primary research output for which academics in business disciplines and economics are typically judged. When identical articles were published in different journals, both were counted. In one case, the second journal was not on Beall's list, but the second article was counted as the equivalent of a predatory publication.

All departments have faculty members with predatory publications. The positive entries for median publications in all departments, except management, indicate that the majority of researchers in these departments have predatory publications. The greatest number of predatory publications by a single faculty member is ten. One individual with four publications has 100 per cent of them in predatory journals. In total there are seventy-seven publications in predatory journals, representing 15.5 per cent of the school's journal publications. All academic departments have published members who have no predatory publications.

At the other extreme, most departments (with the exception of management) also have individuals with A*-ranked publications. For a young university, this is commendable. Every academic department also has publications in both A- and B-ranked journals.

TABLE 1. Publications through 2015 by department,[†] not prorated by number of authors

Variable	Accounting & Finance	Economics	Management	Marketing	All
Beall listed					
Mean (SD)	2.7 (3.8)	1.75 (2.2)	0.9 (1.5)	3.1 (3.7)	2 (2.8)
Median	0.5	0.5	0.0	2.0	0.0
Range (no.)	0–8	0–6	0–5	0–10	0–10.0
Range (%)	0–39	0–67	0–50	0–100	0–100
Total	16	28	8	25	77
Ranked A*					
Mean (SD)	2.0 (3.2)	0.5 (0.8)	—	0.5 (0.9)	0.6 (1.5)
Median	0.5	0	—	0	0
Range (no.)	0–8	0–2	—	0–2	0–8
Range (%)	0–22	0–50	—	0–50	0–50
Total	12	8	0	4	24
Ranked A					
Mean (SD)	3.5 (4.6)	1.2 (1.6)	0.6 (0.9)	1.9 (2.7)	1.5 (2.5)
Median	1.5	0	0	0.5	0
Range (no.)	0–11	0–5	0–2	0–7	0–11
Range (%)	0–31	0–50	0–50	0–50	0–50
Total	21	19	5	15	60
Ranked B					
Mean (SD)	4.2 (6.4)	3.4 (3.0)	0.7 (1.4)	4.9 (8.5)	3.2 (5.0)
Median	0.5	3	0	1	1
Range (no.)	0–15	0–10	0–4	0–25	0–25
Range (%)	0–25	0–57	0–40	0–51	0–57
Total	25	54	6	39	124
Ranked C					
Mean (SD)	8.3 (8.8)	1.75 (1.77)	1.1 (1.6)	6.2 (5.6)	3.5 (5.1)
Median	6.5	1	1.0	5.5	1.5
Range (no.)	1–24	0–5	0–4	0–18	0–24
Range (%)	8.3–100	0–26	0–40	0–75	0–100
Total	50	28	9	50	137
Both (predatory and ranked)					
Mean (SD)	2.3 (3.6)	0.68 (1.3)	—	2.1 (2.9)	1.1 (2.2)
Median	0	0	—	0.5	0
Range (no.)	0–7	0–5	—	0–7	0–7
Range (%)	0–39	0–26	—	0–75	0–75
Total	14	11	0	17	42
Unclassified					
Mean (SD)	5.0 (9.0)	0.6 (1.6)	3.3(4.5)	4.0 (4.3)	2.9 (4.5)
Median	1.5	1	1	2	1
Range (no.)	0–23	0–4	0–12	0–12	0–23
Range (%)	0–32	0–100	0–100	0–43	0–100
Total	30	24	30	32	116

[†] All faculty with research responsibilities plus any full-time teaching-only faculty and seasonal faculty with publications are included in this table (the number of faculty in each department is given in the bottom row of Table 2). Faculty teaching in multiple departments are counted in the department related to the majority of their research. Retired professors are included if they either were not retired during the period that the salary data cover or had emeritus professor status.

Some journals are on both Beall's list and the ABDC list. All departments, except management, have some publications in such journals. Thus, the above categories double-count forty-two publications. Of these, three are in journals ranked B on the ABDC list, and the remainder are in journals ranked C (breakdown not shown in table). One hundred sixteen articles are in journals that are neither on Beall's list nor on the ABDC list. These are referred to as 'unclassified.'

There are many journal rankings, but the ABDC list has the advantage of being the list used internally at the university. Nonetheless, as mentioned in the literature review, Moosa argues that 'bucket classifications' of journals, such as the ABDC ranking, encourage authors to submit to the lowest-quality journal within a 'bucket.'[32] This maximizes publication probabilities within a category. This is consistent with the data here when considering the overlap of C-ranked and Beall-listed journals for the school's business and economics faculty.

The 2013 ABDC list includes 1212 C-rank journals. Virmani found only thirty-four journals on both Beall's list and the ABDC list, which is approximately 2.8 per cent of all C journals on the ABDC list.[33] Thus it is remarkable that 28.4 per cent of all the school's C-ranked publications are among Beall-listed journals. (The 28.4 per cent comes from dividing the 39 C-ranked journal publications that are on both lists by the total of 137 C-ranked publications.) Even if authors exercised no judgement when submitting to C journals, random chance should only produce 2.8 per cent of publications in C journals that are also on Beall's lists. This, however, is not the case.

Additional evidence of faculty aiming for the lowest-quality journals within a category can be seen by comparing publications in journals ranked A by the ABDC list with their ranking by the Association of Business Schools (ABS), a more common business journal ranking. ABS rankings are 1 (the lowest), 2, 3, 4, and 4*.[34] Of the sixty publications in journals ranked A by the ABDC, eight were unranked by the ABS, thirty-one were in journals ranked 1 or 2, and only twenty-one were in journals ranked 3, 4, or 4* (untabulated data).

Not prorating by the number of co-authors, Table 1 double-counts publications co-authored by multiple faculty from the school. Even when co-authors are not part of the school, assigning credit for a full publication is questionable. To compensate for this, Table 2 summarizes many of the same data at Table 1 but prorates publications by the number of

TABLE 2. Publications per faculty member by department,[†] prorated[‡] by number of authors

Variable	Accounting & Finance	Economics	Management	Marketing	All
Beall listed					
Mean (SD)	1.6 (2.4)	1.1 (1.5)	0.9 (1.6)	1.8 (1.9)	1.3 (1.7)
Median	0.2	0.25	1	1.25	0
Range (no.)	0–5	0–4.5	0–4.3	0–4.3	0–5
Total	9.8	18.0	8.3	14.5	49.3
Ranked A*					
Mean (SD)	1.1 (1.7)	0.4 (0.7)	—	0.1 (0.3)	0.4 (0.8)
Median	0.25	0	—	0	0
Range (no.)	0–4.3	0–2	—	0–0.8	0–4.3
Total	6.3	6.3	0	1.2	13.8
Ranked A					
Mean (SD)	1.6 (2.3)	0.9 (1.4)	0.2 (0.4)	0.7 (1.1)	0.8 (1.4)
Median	0.6	0.5	0	0	0
Range (no.)	0–5.8	0–4.5	0–1	0–2.6	0–5.8
Total	9.6	14.5	2.1	5.9	31.6
Ranked B					
Mean (SD)	2.1 (3.2)	2.1 (1.9)	0.5 (1.2)	2.2 (3.1)	1.8 (2.3)
Median	0.25	1.75	0	0.8	0.5
Range (no.)	0–7.5	0–6.0	0–3.3	0–9.5	0–9.5
Total	12.3	33.3	4.8	18.5	70.5
Ranked C					
Mean (SD)	4.1 (4.3)	1.2 (2.3)	0.7 (0.8)	3.7 (4.2)	2.1 (2.9)
Median	3.5	1	0.4	2.7	1.2
Range (no.)	0.25–11.1	0–4	0–2.2	0–13.8	0–13.8
Total	25	19.8	5.3	29.7	79.6
Both (predatory and ranked)					
Mean (SD)	1.5 (2.3)	0.4 (1.0)	—	1.2 (1.6)	0.7 (1.4)
Median	0	0	—	0.5	0
Range (no.)	0–4.5	0–4	—	0–4.3	0–4.5
Total	9	7	—	9.9	25.9
Unclassified					
Mean (SD)	2.5 (4.5)	1.0 (1.1)	2.6 (3.1)	2.1 (1.9)	1.7 (2.5)
Median	0.7	0.8	1	1.6	1
Range (no.)	0–11.5	0–4	0–8.3	0–5.2	0–11.5
Total	14.8	15.8	20.6	16.8	68.0
Number of persons	6	16	8	8	38

[†] The same faculty are included as in Table 1.
[‡] A publication with x co-authors is counted as $1/x$ of a publication for each co-author.

co-authors. The total number of publications is reduced to 286.95. The actual number of publications on Beall's list is reduced to 49.3, but as a percentage of total publications, it increases slightly to 17.2 per cent. The proportion of publications in C-ranked journals that are also on Beall's list increases to approximately 32 per cent. Otherwise, the results are fairly consistent with those in Table 1.

Evidence from Descriptive Statistics of Publication Motivations

Researchers may be unknowing victims of predatory publishers or may knowingly submit to predatory journals. Both outcomes are possible. But it seems likely that inexperienced researchers would be more likely to fall victim to predatory publishers. One measure of researchers' experience is whether research is part of their employment responsibilities.

Faculty in the university's business and economics school can be classified according to their research responsibility. Many of the school's faculty are *sessional* instructors, the first group, the majority of whom do not have PhDs and would be expected to lack significant research experience. In the second group are full-time faculty members with no research responsibilities. The collective agreement (i.e., employment contract) refers to them as bipartite faculty. However, as many readers will be unfamiliar with that term, I call them *teaching-only* faculty. Until relatively recently, they made up a majority of tenured and tenure-track faculty. Many do not have PhDs (including three of the four with publications) and hence would be expected to have less research experience. Another group is composed of faculty with both teaching and research responsibilities. The collective agreement refers to them as tripartite faculty, but I refer to them as *traditional* faculty. All but one has both a PhD and publications. Traditional faculty would be expected to be the most familiar with research. Recently *retired* faculty are classified as a fourth group. All persons in this group are still affiliated with their departments, either as emeritus professors or adjunct professors. Two teach part-time as sessional instructors. However, as they have PhDs and a career of research experience, it does not seem appropriate to group them with other sessional instructors.

Table 3 compares the publication records of the four groups: 1) sessional, 2) teaching-only, 3) traditional, and 4) retired.

As expected, traditional faculty have the greatest number of publications. They have more publications than sessional and teaching-only faculty for each type of publication. Thirty-seven per cent of them have also won one of the research awards the school gives out each year. (More details on these awards will be given in another section below.) This reinforces the argument that this group should have more research experience. However, if we compare them with sessional and teaching-only faculty who have publications, we see that traditional faculty are not less likely to have predatory publications. Indeed, of traditional

TABLE 3. Descriptive statistics by employment type for faculty

Variable	Sessional	Teaching-only	Traditional	Recently retired
Number w/ publications	6	4	26	3
Number w/o publications	14	8	1	0
Beall listed				
Mean	0.24	0.4	2.6	0.0
Median	0.0	0.0	1.0	0.0
% w/ predatory publications	9.5	16.7	59.3	0.0
% of those w/ publications who have predatory publications	28.6	50.0	61.5	0.0
Ranked A*				
Mean	0.0	0.0	0.7	1.7
Median	0.0	0.0	0.0	2.0
Ranked A				
Mean	0.05	0.1	1.8	4.0
Median	0.0	0.0	1.0	5.0
Ranked B				
Mean	0.25	0.1	3.4	9.7
Median	0.0	0.0	1.5	3.0
Ranked C				
Mean	0.2	0.2	4.8	3.0
Median	0.0	0.0	3.0	2.0
Both ranked and Beall listed				
Mean	0.1	0.0	1.5	0.0
Median	0.0	0.0	0.0	0.0
Unclassified				
Mean	0.2	0.2	3.5	1.5
Median	0.0	0.0	3.0	1.0
Recipient of school research award	0	0	10 (37%)	0

faculty with publications, 61.5 per cent also have predatory publications. This compares with 50 per cent of published teaching-only faculty and 28.6 per cent of published sessional faculty.

No retired faculty have predatory publications. Given that predatory journals are a relatively recent innovation, they would have been experienced researchers by the time they were exposed to predatory journals. This counters the evidence of the previous paragraph, which suggests that inexperience does not alone explain why researchers publish in predatory journals. However, it is difficult to draw firm conclusions from such a small sample of retired faculty.

TABLE 4. Faculty with predatory publications by employment type

Variable	Sessional	Teaching-only	Traditional
Faculty w/ predatory publications	2	2	16
Faculty w/ more than one predatory publication	2 (100%)	1 (50%)	12 (75%)
Mean no. of predatory publications	2.5	2.5	4.3
Having a PhD or DBA[†] and predatory publication	2	1	16
Assistant professors/lecturers, fall 2015	N/A	0	1
% of all assistant professors/lecturers	—	0	10.0
Associate professors/senior lecturers, fall 2015	—	2	11
% of all associate professors/senior lecturers	—	16.7	68.8
Full professors/principal lecturers, fall 2015	—	0	4
% of all full professors/principal lecturers	—	0.0	100
Recipient of research award	0	0	9 (56.2%)
Hired w/ predatory publication	2	0	5
Tenure and/or promotion w/ predatory publication[‡]	N/A	1	9

[†] For brevity and simplicity, text and tables make no distinction between PhD and DBA degrees and refer to both as PhDs.

[‡] This number is a low estimate. Whenever it was unclear whether a publication in a predatory journal took place early enough in the year to be included in a promotion and/or tenure application, it was not included in this count.

Focusing on those who publish in predatory journals can provide further evidence of their motivations. Even honest researchers make mistakes and can be fooled into publishing in predatory journals. However, when researchers demonstrate a pattern of publishing in such journals, suspicions increase. Indeed, research on scams has assumed that initial victimization increases awareness of a scam, making further victimization unlikely.[35] Table 4 summarizes the data specifically for researchers who published in predatory journals, so retired faculty are not included. It can be seen that 75 per cent of traditional faculty who have predatory journal publications have more than one such publication. Moreover, traditional faculty who have predatory publications have, on average, 4.3 predatory publications. Other faculty with predatory publications have 2.5 on average.

Those with predatory publications do not seem to be inexperienced. Only one author with a predatory publication does not have a PhD. Moreover, predatory publications increase with academic rank. Only 10 per cent of those who were assistant professors in the fall term of 2015 have predatory publications compared with 68.8 per cent of associate professors and 100 per cent of full professors.[36] Notably, 56.2 per cent of those with predatory publications have won school research awards.

Although it is impossible to discern the motivations and intentions of those who publish in predatory journals, these descriptive statistics imply that, at least in some instances, it may not be due to inexperience and one-time mistakes.

Hiring, Tenure, and Promotion

As can be seen in Table 4, it was possible to determine that seven individuals had predatory publications before they were hired. Five of these were traditional faculty with research responsibilities. Without information on the pool of applicants applying for positions, it is impossible to know if predatory publications lower the probability of being hired. However, the evidence is that they do not disqualify applicants.

An attempt was also made to determine whether individuals who successfully went through either the tenure and/or the promotion process between 2010 and 2016 had publications in predatory journals. In this case, data collection was more difficult as both promotion and tenure applications are submitted at the beginning of September. Publications in predatory journals in the same year as an application are not uncommon, and it is often difficult to verify that they occurred before a tenure and/or promotion application. Only predatory journal publications that were clearly before a tenure and/or promotion application are included in Table 4. Thus, the figures reported are underestimated. Ten such applications were successful (nine involving traditional faculty). It is noteworthy that every individual promoted to full professor (i.e., not hired as a full professor) already had predatory publications when she or he was promoted. Thus predatory publications do not seem to rule out successful tenure and promotion applications.

Relationships between Salary and Research Output

Statistical regressions were performed to investigate the relationships between salary and research output. Full-time teaching-only faculty,

TABLE 5. Regression with 'ln Salary'[†] as dependent variable ($n = 27$ faculty)

			White's HCCM[‡] estimation			
			Full model[§]		Reduced model[‖]	
Variable	Mean	SD	Coefficient	p	Coefficient	p
Research award	0.37	0.49	−0.33792	0.022	−0.48010	0.053
Other awards	0.37	0.75	−0.10640	0.266		
Predatory and unranked journals	1.04	1.48	−0.03958	0.487		
Predatory and ranked journals	1.52	2.50	−0.07649	0.108	−0.06665	0.106
Ranked A* journals	0.78	1.69	−0.27480	0.080	−0.27736	0.031
Ranked A journals	1.96	2.77	0.18179	0.063	0.16766	0.045
Ranked B less Beall-listed journals	4.00	5.33	−0.06821	0.098	−0.06589	0.039
Ranked C less Beall-listed journals	3.56	4.88	−0.07431	0.029	−0.06357	0.032
Unclassified journals	3.89	5.18	0.01510	0.412		
Average publications per year	1.29	0.69	0.74192	0.053	0.73643	0.019
Years since first publication	12.09	8.62	0.00512	0.4081	0.01110	0.164
Associate professor	0.48	0.51	0.07286	0.718		
Full professor	0.15	0.36	0.57845	0.009	0.53559	0.047

[†] 'ln Salary' represents the natural logarithms of the salary data. This formulation is commonly used by economists in regressions involving salary data.
[‡] White's heteroscedasticity-consistent covariance matrix
[§] $R^2 = 0.5414$, adjusted $R^2 = 0.0828$
[‖] $R^2 = 0.5269$, adjusted $R^2 = 0.2756$

sessional faculty, and administrators have no research responsibilities. As their compensation should be independent of research output, they were excluded from the sample used. However, retired faculty who were still working full-time in the fiscal year that the salary data cover were included in the sample.

Summary statistics and regression results are given in Table 5. The first variable is the number of internal research awards a person received. As no one has received two awards, this is effectively a dummy variable. There are also up to two teaching awards and two service awards presented each year. As several faculty have won a teaching award and a service award, values for this variable range from zero to two.

Predatory journals are divided into two groups: those included in the ABDC ranking and those not included. Publications in ABDC-ranked journals that are not also on Beall's list are separated according to their respective ranks. Articles published in journals that are on neither the ABDC nor on Beall's lists are represented by the variable 'unclassified.'

One would expect compensation to increase with seniority, as progression through steps on the pay scale is automatic until one reaches a ceiling. In addition, the collective agreement specifies rules relating years of experience to initial placement on the pay scale. Unfortunately, academic calendars at the university do not include lists of faculty and the years they received their PhDs. Instead, the number of years between an individual's first publication and 2015 is used as a proxy variable. This variable is named 'years since first publication.'

'Average number of publications per year' is simply an individual's total publications divided by the number of years since that person's first publication. Associate professor and full professor are dummy variables for an individual's academic rank. Although there is considerable overlap in the pay scales for academic ranks, one would expect the coefficients of these variables to be positive. Unfortunately, academic promotions do not coincide with the fiscal year. However, the academic rank before 1 July 2015 was used so that all individuals would have had that rank for at least nine months of the fiscal year corresponding to the salary data.

Consistent with other papers that measure the return to research,[37] the best results were obtained with a log-linear model. Moreover, models with publications prorated by the number of authors were initially estimated but found to have less significance than models in which individuals were given full credit for multi-authored papers. This is consistent with Liebowitz's finding that common reward schemes do not sufficiently prorate joint works.[38]

The model was initially estimated with all variables, and then a general-to-specific model reduction process was applied.[39] Articles in journals ranked A*, as well as B and C journals not cross-listed on Beall's list, all have negative and statistically significant coefficients. This is consistent with time devoted to research being a substitute for extra teaching. The negative payoff for A* publications is particularly large, indicating that each such publication can be expected to reduce compensation by 27.7 per cent. Publications in Beall-listed journals are statistically insignificant. Thus, in terms of financial rewards, predatory publications are preferable to A*, B, and C publications. The positive and statistically significant coefficient for A publications is an exception. It implies that A publications are rewarded enough to compensate for lost income from extra teaching.[40]

The large and statistically significant coefficient for average number of publications per year indicates that the quantity of research (holding journal rank constant) is positively rewarded. This variable is particularly important. When it is dropped from the regression, the remaining variables become insignificant.

The negative sign for the research award variable may seem unexpected. Research awards are discussed in more detail in the next section. For now, it is merely noted that if research award is dropped from the regression, the significance of A, B, and C publications is reduced but is still significant at the 10 per cent level, with the same signs.

Note that, as with other studies relating research output to salary, the compensation data are for a given fiscal year but the publication data are generated over an individual's career. Therefore, these results imply that those who were willing to sacrifice extra income in the past for their research are still making the same choice. Indeed, these estimates can be seen as a lower bound on the intrinsic value these individuals place on their research.

Research Recognized by Awards

Even though most research is not positively rewarded (holding constant the quantity per year) in terms of financial compensation, this does not necessarily mean it is unrecognized. For example, faculty often request that their new publications be mentioned in their chair's report to the monthly faculty council meetings. In addition, up to two research awards have been made every year since 2010.

One research award is the faculty council award for research excellence, and the other is the dean's award for research excellence. There are also two similar awards for service and two for teaching. Nominations (typically self-nominations) are made to the committee for research and teaching practices of the faculty council. The faculty council's charter mandates it to facilitate access to promotion and tenure as well as to funding. Its membership must include at least two teaching-only faculty and at least two traditional faculty.

The committee decides who receives the faculty council awards and recommends faculty for the dean's awards. Typically, both sets of awards are made each year, but there have been exceptions. For example, in 2016 there were not enough nominations to make both sets of awards, so only the faculty council awards were given. Between 2010 and the winter term of 2016, ten awards for research were given in total.

TABLE 6. Linear correlation coefficients with research awards

Variable	Correlation
Predatory, non-ranked publications	0.714
Predatory and ranked publications	0.045
Articles in A*-ranked journals	−0.234
Articles in A-ranked journals	−0.151
Articles in B-ranked journals (non-predatory)	0.419
Articles in C-ranked journals (non-predatory)	−0.059
Articles in unclassified journals	0.208
Member of committee in year of award	0.461
Average publications per year	0.391
Received another award	0.664
Years since first publication	0.009
Assistant professor	−0.330
Associate professor	0.432
Full professor	−0.168

Initially, attempts were made to use logistic regressions to determine the type of research for which these rewards are given. However, given the small sample size, the results were very sensitive to initial conditions. For example, the results changed when the 2016 award was added. In addition, the only statistically significant variable (when the last award was added) was the number of predatory publications, which had a positive effect. However, the same variable also had a positive and statistically significant effect when the dependent variable was a qualitative variable for having won one of the other awards. Thus, a reasonable interpretation would be that the number of predatory publications may indicate an unobservable characteristic of those who self-nominate for awards rather than a causal relationship between the number of predatory publications and receipt of an award. Reinforcing this interpretation is the observation that only one individual who has won a research award had no predatory publications. Therefore, this section considers the correlation coefficients given in Table 6.

The strongest positive correlation with research awards is the number of publications in predatory journals (0.714). This is followed by being a recipient of either a teaching and/or a service award (0.664) and being a member of the committee the year one receives an award (0.461).[41] The rank of associate professor, the number of articles in B-ranked journals,

and the average number of publications per year also have relatively strong positive correlations. The number of articles in journals ranked A* and A have smaller but negative correlations. These statistics indicate that the research awards are unlikely to be significant motivators for publishing in high-quality, or even simply non-predatory, journals.

DISCUSSION AND CONCLUSIONS

Predatory journals have become an increasing problem when it comes to assessing and rewarding researchers for the merit of their publishing records. In addition, the presence of predatory journals makes it difficult for non-experts to judge the quality and validity of published research. This paper finds that, at least at one university, there are few incentives not to publish in predatory journals. In addition, when the opportunity cost of forgone income from extra teaching is significant, publishing in ranked journals is costly.

A number of questions for future research on predatory publication are raised. A key question is the degree to which these findings are generalizable to business schools, and other faculties, at other universities. The similar proportions of questionable publications reported by Ray suggest that the results may be generalizable to other business schools, but additional research is needed. This type of research involves time-consuming data collection, and answering these questions would require significant research support. However, the benefits of better understanding the market for predatory publications would be substantial. For example, such data could be used to study whether faculty research output is improved when administrators also have a research background.

If one assumes that, on average, higher-ranked journals contain better research, the negative rewards for publishing in most ranked journals (especially A* journals) are troubling. Whether the best solution is to use the stick (deny extra teaching opportunities to faculty), to dangle the carrot (increase rewards for quality publications), or simply to ignore the problem remains an open question. And whether those earning income from extra teaching would otherwise have used their time for research or for leisure is beyond the scope of this paper.

Given the increasing number of predatory journals and the problems associated with them, a better understanding of the incentives for those who publish in them is needed.

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NOTES

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30. Unlike many universities, at the university studied, the term 'adjunct faculty' does not refer to sessional faculty. Rather, it is more of an honorary position for individuals who enhance the intellectual life of the university but who may never have taught a course or received any financial compensation and may rarely visit the university.
31. Indeed, one researcher informed the author that, due to a co-author's submission, he had a publication in such a journal. Note that Beall's list does include some subscription publishers.
32. Moosa, 'A Critique of the Bucket Classification of Journals.'
33. V. Virmani, 'Open Access Temptations: Buyer Beware' (unpublished manuscript, March 2016), available at http://www.iima.ac.in/assets/snippets/workingpaperpdf/10046630992016-03-49.pdf. Note that Virmani does not break down the overlapping journals by journal rank. Thus, this statement assumes that the majority are C-ranked journals. To the extent that they are not, the difference between Virmani's figure and the publication record of the school's authors is greater. Noteworthy also is that the ABDC has recognized a problem and reports that, in 2016, it will conduct an interim review, in part, for the 'removal of very low quality journals — e.g. deemed to be "predatory open access" journals.' See Australian Business Deans Council, 'ABDC 2016 Interim Journal Review' (29 September 2016), available at http://www.abdc.edu.au/pages/2016-review.html.
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39. Initially, the model was estimated with ordinary least-squares regressions. Diagnostic tests were performed, and the null hypotheses of homoscedasticity were rejected. In particular, the model failed the Breusch–Pagan and the Glejser tests for homoscedasticity. Although the estimated coefficients would still be unbiased, the *t* statistics could be called into question. Therefore, the model was re-estimated using White's heteroscedastic-consistent covariance matrix estimation. This will not change the coefficient estimates, but it will change the *t* statistics.
40. This result can be explained with an economic model where financial rewards for publication increase with the rank of the publication but at a decreasing rate. At the same time, opportunity costs in terms of time lost from extra teaching also increase with the rank of a publication. It may be that net benefits are maximized for A-rank publications and are negative for other publications.
41. Committee members who are nominated for an award do not take part in the adjudication of their award (even when they are the chair of the committee). Thus, the causal effect may be through knowing who else has nominated themselves for an award and taking advantage of opportunities to self-nominate when competition is weak.