

The Faustian Grip of Academic Publishing
Robert P. Parks
Department of Economics
Washington University
St. Louis, MO 63130
Contact: bparks@wuecon.wustl.edu
(314)935-5665
July, 2001

Abstract

The journal acquisition budget of libraries is not increasing at the same rate as subscription rates creating the serials' crisis. Many solutions have been proposed including the freely available electronic journal. However, all the solutions suffer the same Faustian Grip - namely that the actors in the academic publishing game have little or no incentive to stop publishing in the current journals. We examine those incentives concluding that even with a better more efficient technology, the actors will not change from the current academic publishing institution, and the serials' crisis will remain.

Introduction

There has been much written about the current serials crisis. There has also been a substantial amount written about electronic journals, freely available journals, author self-archiving, author or institution retained copyrights, etc. My goal in this essay is to bring up some points that I do not think have been made before in this discussion.

First, a one time reduction in costs, say due to electronic rather than printed delivery, will only put the crisis off a few years, not solve it. To solve the serials crisis forever requires a complete overhaul of academic publishing, moving academic publishing into an era of freely available electronic journals whose costs are born as part of academic life. Second, we have to examine the incentives of the players in academic publishing to understand that none of players have incentives to change the current institution. Whatever solutions are proposed must take these incentives into account. Utopia is a great place, but getting there is hard if not impossible.

In what follows, I make some remarks about the serials crisis. I propose a solution to the serials crisis - namely the freely available electronic journals. The bulk of the essay discusses the incentives of the actors in the institution of academic publishing, showing that they have little or no incentive to change. Although I use freely available electronic journals as a straw man, any solutions that are proposed to the serials' crisis must examine the incentives of the actors, and I hope that this essay provides a starting point for that.

Serials Crisis

The serials crisis is the budgetary pressure on libraries due to increased costs for maintaining a journal collection. The increased costs come from price increases of extant journals, and from new journals entering the market, and now the additional costs of electronic versions of traditionally printed journals. One solution is simply to increase budgets. Another is to cancel subscriptions, and to avoid subscriptions to new journals. A hope is the electronic distribution versus paper distribution would solve the problem.

Price increases of extant journals range from very nominal two to four percent increases to very large increases such as with *Evolutionary Ecology* which had an 800% increase in 15 years (Rosenzweig 1999, Mitchel 1999). New journals add to this pressure on budgets. Lovell (1973) estimates that the cumulative stock of journal articles doubles every 14 years, or a 5% increase per year. Joyce (1990) estimates that doctoral academics in the US grew about 3.3% per year. Additionally, there is additional pressure in colleges to publish versus 30 years ago. One library shows a 94% increase in its serial acquisition budget from 1990 to 1999 or about 8% per year (Loughner, 1999). Even if library budgets kept pace with journal price inflation, new journals containing the additional publications from additional doctoral academics and from more output per academic would still create a crisis. And serials prices have been increasing between 10 and 15 percent per year in the last decade.

Distribution costs of printed journals have been estimated to be between 20 and 80 percent of the cost of a journal (Odlyzko, 1995, Harnad, 1998, and Boyce, 1998). Distribution costs are not the primary reason for increased journal subscription prices, and certainly they are not the reason for budgetary pressures to subscribe to new journals. Hence, even if those distribution costs are eliminated with electronic distribution, the serials crisis would only be averted for a brief time.

Unless the other factors determining costs are changed, the current serials crisis will rear up again in 2 or 5 or 10 years as illustrated in figure 1. Lowering or eliminating distribution costs shifts the time-price line down and might even reduce its slope slightly, but when the one time savings in distribution costs is no longer enough to offset the other price increase factors, we again face a serials crisis. Pushing the problem onto our heirs and successors is no solution. A solution to the serials crisis requires changing the current production method into something else which will not have the same factors causing the current price increases.

Tenopir and King (2000) provide some detail on price increases, showing that even adjusted for inflation, journal prices increased an average of 6% per year from 1975 to 1995 (chapter 13). The reasons for such (inflation adjusted) price increases are many: exchange rates, larger publishing houses, more pages per journal, circulation, and privatization of publishers, to mention a few. And this is not a recent phenomena - Tenopir and King show similar price increases from 1960 to 1975. Our point is that prices are increasing, and increasing faster than library budgets.

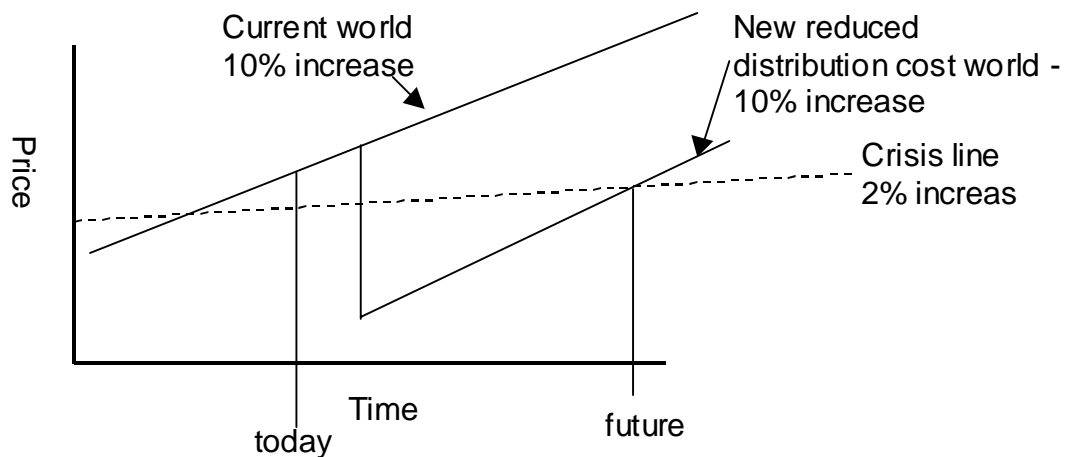


Figure 1

One can imagine that universities might magically figure out a way to increase the library serials acquisition budget, hence increasing the crisis line's slope to say 10 percent so that there is no crisis. But it is doubtful that will happen. Hence other solutions must be found.

Boyce (1998) states "*We have found that by using the electronic-first philosophy we could offer the electronic-only subscription as our prime product at 70-80 percent of the present cost of the paper subscription.*" If so, then that might solve the serials crisis for 20 to 40 years and most of us will not be around for the next crisis. As Keynes said, "*In the long run, we are all dead.*" I will proceed however thinking that the world is more akin to a short run solution if only the distribution costs are saved by an electronic journal.

FAEJ - Freely Available Electronic Journal

As an example of a fully electronic journal and its efficiency, consider the Electronic Journal of Combinatorics (<http://www.combinatorics.org/>). It is freely distributed and the only subscriptions are to e-mail notification lists. Authors submit articles in TeX /LaTeX, using the American Mathematical Society style. Upon submission, the electronic version is sent to referees, via e-mail, with software keeping track of the process. Upon editorial acceptance, software creates the journal article, which is then distributed as a link on the journal's web page. Comments are automatically attached to the article with entries in the table of contents.

There is no out of pocket cost to produce the journal. The editors, associate editors and referees receive no compensation other than the prestige and reputation of editing or refereeing. The marginal article has no production cost as it is all done by software, including the management functions of the editor (receiving new submissions, sending articles out to referees, distributing referee reports to authors, etc.).

Two major editorial headaches of hard copy journals are avoided: there are no publication backlogs nor problems of filling an issue of the journal; and there are no length problems. Both are significant problems in hard copy journals. Each issue of a hard copy journal must have about the same number of pages - two few articles and the

editor must scrounge for additional articles; too many articles and either the publication backlog increases or the editor argues with the publisher/printer for more pages or issues.

As the process of acceptance of articles for the journal is the same as it is for a hard copy journal, the 'filtering' function is identical and the reputation of the electronic journal depends on the same criteria as that of a hard copy journal. With a style standard like AMS-TeX, and electronic submission, there are no copy-editing costs. That experience might not transfer to other areas. Some journals/editors report that there is no copy-editing cost while others report quite significant costs (Goffe and Parks, 1997, Jog 1995).

If the editor chooses to edit the text, correcting grammar and presentation, the editor makes that choice and the compensation is a better journal (at least in the mind of the editor). The editor can also choose to force the author to edit her text --- placing the costs of text editing where they should be rather than subsidizing authors who write poorly.

With such a FAEJ, there are no costs (except for the minuscule storage costs, and some hardware administration and replacement costs). Editors are not paid, publishers do not have profits, copy editors are non-existent (or not paid by the journal), office staff is electronic, and submission fees are not needed. The only costs are start up costs to develop the web pages and software to control the journal, which can be shared among other journals.

In my own discipline, the Journal of Economics and Finance is a FAEJ. Although there is a submission fee of \$25 to \$45, and costs are subsidized by a society, the journal shifts much of the production cost onto the author. After an article is accepted for publication, it must be formatted according to the journal's specifications. For example, "3. For the main text, use Times Roman 10 point, single spacing, with all text fully justified. Leave only one space between sentences, not two! Set left and write margins to one and a quarter inch, top and bottom margins to one inch. Indent new paragraphs 0.2 inches from the left margin." (<<http://www.mtsu.edu/~jeandf/instruct.htm>>). With such specifications, the electronic copy of the journal is produced with very little cost in copy editing and transcription to PDF format, and the pages when viewed look and feel like a S/SL/PPV journal.

We now turn to our major thesis, namely that such journals will be rare. The world will not change and the reason is that we are stuck in the current equilibrium.

Faustian Bargain and Grip

Stevan Harnad has coined the term Faustian Bargain.

"For the Faustian Bargain is this: if you wish to immortalise your words at all, you will have to surrender your copyright in exchange, so your publisher can recover the substantial cost of getting your intellectual goods aboard the paper flotilla at all. The author must collaborate in denying access to his adverts to anyone who (or whose library) has not paid for them." Harnad (1997)

Harnad contrasts a trade author and esoteric (academic) author. The trade author writes to receive direct remuneration while the esoteric author writes to obtain indirect

remuneration - fame, tenure, promotion, invitations to conferences, and even possibly just because she likes to further knowledge. The bargain between the esoteric author and print publishers is Faustian because *ceteris paribus* she has no desire to restrict readership. The trade author and the publisher want to restrict readership to those who pay because for the trade author, paying is definitionally the incentive to write. For the esoteric author, there is no direct payment from reader to author (via a publisher) as there is for the trade author. Hence the only reason (according to Harnad) for the esoteric author to desire limited readership (due to a subscription to a journal) is that otherwise (at least historically) there was no other way to have a readership. The publisher provided the distribution mechanism to pave the way to readership and hence fame, tenure, promotion, etc. Giving the publisher the copyright was a Faustian bargain that seemingly could not be avoided.

Harnad's goal in breaking the Faustian bargain is to make esoteric writing available to all for free. He certainly does not advocate the end of scientific review.

*"But what about the scholar and his publisher? In the "Papyrocentric" Age, despite the conflict of interest inherent in restricting access to his work to those who have paid for it, the scholar/scientist had to collude in resolving the conflict in favour of his publisher (or rather in favour of the Mephistophilean Diktat of the Gutenbergtechnology) if he wanted to advertise and immortalise his work at all. This epoch is over; the distribution of the fruits of Learned Inquiry can at last be freed from the **Faustian grip** of the paper era."* Harnad (1997)

Certainly the experience in Physics with the Los Alamos Preprint Archive (<<http://ArXiv.org>>) seems to provide evidence that the Faustian Grip is at an end. There are more than 120,000 'preprints' available to all for free. In Economics, the RePEc collection has more than 15,000 'working papers' available to all for free. However, there are still journals published by both commercial and 'non-commercial' publishers, serials' costs are still escalating, and from that vantagepoint, scholarly writing appears to be held in the grip.

But we can (and in my belief will) have an equilibrium in which 'preprints' and 'working papers' are available to all for free, and journal articles are restricted to subscription, site license, or pay-per-view restrictions (S/SL/PPV). We must examine the actors in the game of academic publishing, their incentives, and the institutions that surround the actors. Harnad does not see the grip holding like this:

The scenario branches here for those publishers who do elect to change and those who don't: Those publishers who do not restructure themselves, who persist in trying to use the subscription or site license or pay-per-view model (S/SL/PPV) for cost recovery, especially if they attempt to use submission policy and copyright as a way of preventing their authors from publicly archiving their preprints and reprints, respectively (as many are doing now), they will simply lose their Editorial Boards, who will emigrate to the Web on their own, under user pressure (after all, they are us!), and will reconstitute themselves as electronic-only

journals, with or without the old brand name, so as to recover the much lower page costs through author-end page charges, instead of S/SL/PPV, all of which block access to the reader. Harnad (1997)

I certainly would like to agree with this scenario but for reasons presented below, it will not happen. Publishers who persist in using the S/SL/PPV model will persist. Preprints, working papers, and even reprints which are dated may be available to all for free, but the current institution of academic review/journals will remain, as it has for physics.

The actors in the game

The actors in the game of academic publishing are: authors, editors, referees, publishers, librarians, department chairs/deans, and readers/users. Some of the actors are schizophrenic - wearing two or more hats. We distinguish publishers as those who produce collections of articles into journals and use S/SL/PPV to recover costs (and profits). Hence editors rather than publishers create FAEJ. We use the general term academics to encompass authors, editors, referees, and readers. If that academic is also a department chair or dean, we ignore the academic roles and concentrate on the administrative roles. Librarians are those who provide access to the S/SL/PPV literature. Of course the humans labeled librarians are also wear academic hats, and administrative hats, but we ignore that part of their schizoid existence.

There appear to be two major reasons (incentives) for changing the S/SL/PPV model: 1. Readership is limited; and 2. Costs are escalating. Although authors desire greater readership, that is not their major goal and in fact may even be counter productive because more readers may demand more time from authors to explain their writing. The major issue then is costs - and the institutional structure that we currently have does not articulate the preferences for lower costs into action.

Librarians

Librarians acquire, collect, catalogue, shelve, search and distribute information. More and more they are concerned with licensing and copyright issues. They are a major part of the 'market of distribution' for learned inquiry. Without library subscriptions, the S/SL/PPV publishers could not survive. Academic readers also could not survive. Libraries are part of the overhead cost of a university. The value of library services is only indirectly, if at all, related to the budget of the library.

Journal subscription prices have risen by about 8% per year in the last decade while library budgets have increased by about 2%. And there are many new serials adding pressure to the budget. Libraries are under pressure to reduce their journal acquisitions costs. That would seem to provide a clear incentive on the part of librarians to desire a world of FAEJ.

But what are the incentives for librarians? Consider their quandary if on the first day of the new millennia the S/SL/PPV model of journal publishing disappeared, replaced by FAEJ. Their serial acquisition budget would disappear and the staff supporting those acquisitions would need to find other employment. Although librarians have great incentive to keep serials expenditures from increasing, they also have a substantial

incentive to maintain the budget or increase it. If serial acquisition costs were increasing at the same rate as the budget for serials, librarians would have little incentive to change the status quo, and some if not great incentive to maintain it (else they need to revise the resume).

The ARL's development of SPARC is meant to reduce the pressure on the librar budget - it is not meant to end it. SPARC might be a good idea if the increases in serial costs are due to 'glutinous' publishers. However, SPARC will face most of the same costs of producing journals as the current S/SL/PPV publishers, possibly reducing some costs such as profits, marketing costs, and other 'frills'. If the increases in journal costs are due to those profits and frills, then SPARC will simply replace the current S/SL/PPV with a leaner more efficient S/SL/PPV. The pressure on budgets might end but the status quo remains.

Librarians provide services for readers. Readers should desire reduced costs but readers are unable to articulate those preferences via librarians to the administration of the university. Librarians could ask physicists "Now that ArXiv.org has all the papers you desire to read, can we end our subscriptions to ...". The answer is of course "NO". If the question was put differently, such as "Now that ArXiv.org has all the papers you desire to read, do you prefer a graduate student or your subscription to ...?" In that case the answer could quite possibly be "Give me a graduate student." But librarians are not the actor who determines such a trade-off.

My point is that librarians do not have an incentive to revolutionize academic (esoteric) publishing, only to keep serials costs in line with budgets. Second, librarians are unable to articulate preferences of their users, or at least unable to articulate them as well as we would like for an optimal market outcome. So, librarians will not change the system from its current S/SL/PPV into a FAEJ world.

Universities

Universities certainly prefer to spend less while getting the same output, as do all producers. In a perfect new millennia, FAEJ would solve the university's problem of serial acquisition, and serial storage. However, unless we simply awake one day where all S/SL/PPV journals are transformed into FAEJ, the transition can not happen.

Universities must maintain libraries in order to attract professors and in order to attract students. Our own library, in the 1970's sold our printed copies of *Econometrica*, and in return we had microfiche. Although many of us complained, we remained a library with microfiche onl *Econometrica*. And then the university wanted to attract a senior professor, who finding that the library had only microfiche made it a condition of employment that a hard copy edition of *Econometrica* again be placed in the stacks.

The point is that if university A has S/SL/PPV journals in its stacks and universit B does not, university B will have a lower reputation. In order to maintain reputation, each university has to keep up with its perceived cohort. Each member of the cohort can not afford to do away with S/SL/PPV journals unless it feels that some significant number of others in the cohort have (or will). This is a prisoner's dilemma game. It would be optimal for all the universities in a cohort to divest themselves of S/SL/PPV in favor of FAEJ but to do so alone has disastrous results. At least in the US, any collusive action b universities invites a lawsuit and presidents and provosts are gun shy. In order to break

away from the inefficient equilibrium in the prisoners dilemma game, some sort of collusive action is needed. But collusive action will not happen at least in the US.

Hence, universities can not be expected to break us away from the current S/SL/PPV.

Publishers

Hard copy 'commercial' publishers want to make profits. Non-profit 'academic' presses desire viability. But their incentive structure is not compatible with adopting a new structure - FAEJ - since that would mean the end of profits and viability. They certainly have no incentive to move away from the S/SL/PPV model that maintains their existence. Possibly the distribution of journals could change to fully electronic, but not to the demise of S/SL/PPV.

One could claim market failure at this point. In other cases, when a new more efficient technique is discovered, new entrants use it, and being more efficient are able to drive out the old inefficient firms. Given this, extant firms must adopt the new technique or face extinction. The new technique in this case is the FAEJ which recovers costs (if there are any) via author page charges or subsidies from societies or universities.

Extant hard copy publishers have two customers - libraries and personal subscriptions. Both customers prefer lower charges *ceteris paribus*. That should mean that more efficient techniques are adopted. Harnad claims "*Those publishers who do not restructure themselves,... will simply lose their Editorial Boards...*". This has happened in at least one case, *Evolutionary Ecology* (Rosenzweig, 1999). But the publisher, in this case, kept the journal (at least its name). And the publisher attracted a new editorial board. It remains to be seen whether the journal keeps its reputation and subscriptions or not. However, the journal did not vanish, and certainly the publisher will do quite a lot to maintain the viability of a profitable journal. What Harnad failed to see was that extant journals may simply replace the editorial board.

If academic journal publishing is a goose that lays golden eggs, publishers will not let the goose fly away without a fight. Most journals now have a web site. Most have table of contents and abstracts freely available. Many (and it is rapidly expanding) have electronic access to the articles for subscribers (either personal or institutional). Readers demand electronic access and publishers, under the S/SL/PPV model, have given it to them at increased charges. Publishers may have to share some of their profits with editors (there are many ways including but not limited to direct remuneration) but publishers will fight to maintain the status quo, and sharing profits with editors is one way to do that.

Hence S/SL/PPV publishing costs more than FAEJ. Publishers will attempt to keep their goose with its golden eggs, and libraries, with their serial budgets, will allow them to remain viable, if not increasingly profitable. FAEJ will not displace them in part due to the mis-articulation of preferences of readers, and in part due to monopoly power from a differentiated product - namely the extant journal.

Authors

Authors receive no direct compensation for their efforts producing esoteric articles. The indirect compensation is the additional entry on the vita, which is used to

convince department chairs and deans to promote, to tenure, to increase salaries, and to give more resources. Reputation is everything, and is the primary incentive for esoteric publication.

The precise motivation of an esoteric author is controversial however - possibly even the motivation of a trade author is controversial. In Harnad, et. al. (2000), we discussed some of the motivations of authors and resultant actions of those motivations. I am reluctant to summarize Harnad or Varian but it appears that Varian and I believe that authors are always motivated by pecuniary compensation (direct or indirect) while Harnad might feel that esoteric authors are primarily motivated to distribute their writings to as many eyes as possible. For Harnad then, FAEJ is quite important and if he is correct, then my thesis here might be suspect.

Readership is important - not simply more readership but 'quality' readership. The 'quality' readers are ones who can, in a direct or indirect way, provide benefits. Citations, inclusion on reading lists at highly ranked institutions, invitations to speak, etc., are the benefits that then translate to promotion, tenure, etc. Authors may not even desire a wide readership (say increasing from 10 to 100) because the additional readers may impose costs that do not have corresponding benefits. Some of the costs are increased questions about a result, and increased correspondence to those offering no benefits. So rather than all eyes viewing an article, authors may desire a limited high quality readership, especially those that cite their work, or write letters of recommendation or invite them to conferences etc. An author does not care if 3 billion people read her paper - she only cares that a few 'important' people read it. Prior to the Internet revolution, she would send a working paper to a selected few, get her paper on a conference program, and submit it for publication. Little changes with the Internet revolution. It is possible that a few more people see her paper, read it, and cite it or put it on a reading list. Whether those additional people actually increase the total compensation for her is questionable.

Where will an author submit an article for publication? Authors submit to the highest quality journal in which the article has chance of being published. Submission also depends on the wall clock time for acceptance/rejection, and generally lower quality journals are quicker for the same quality submission. Given a choice between a S/SL/PPV extant journal (or even a new S/SL/PPV journal) and a FAEJ, the author must determine the long run remuneration effects of a publication in each.

Because the S/SL/PPV journal has expended development costs, there can easily exist a perception that an S/SL/PPV journal must have a higher reputation. A freely available electronic journal can start up without much (out-of-pocket) cost at all. How good can such a FAE journal be in comparison to one that has expended \$100,000 on surveys and marketing? How good can a FAEJ be compared with an extant publisher with a reputation? Those are the questions with which an author must struggle in deciding where to submit her article.

Certainly at the beginning of an academic career, submitting to a journal which has a high reputation is less risky if the article is accepted. But along the hierarchy of quality, wherever the FAEJ is placed, there will be an extant S/SL/PPV journal with known quality and payoff from publication. Submitting to a FAEJ will increase the risk of promotion and tenure with few exceptions (those with a proven editorial board who have abandoned their S/SL/PPV publisher might provide an exception). So the young

author has incentive to remain with the extant S/SL/PPV journal. Convincing a dean that an article in a FAEJ has the same value as a hard copy journal article will be difficult if not impossible.

Older, tenured authors might submit to FAEJs. But they also have to convince deans of the value of their work, which is based on the reputation of the journal in which an article is published. Again, they must choose between an S/SL/PPV reputation or a FAEJ reputation. Quite possibly, they will submit the marginal article to a FAEJ but not their best work. That will go to the best place, which is an S/SL/PPV journal. There might be a few full professors, enamored with electronic technology, and a substantial vita, who will submit to an electronic journal. Even for them, the direct benefit of hard copy publication would be greater than electronic publication, and it could only be the non-pecuniary joy of subverting the S/SL/PPV that could really attract them.

With a FAEJ as we have envisioned it, the author would have the costs of copy editing shifted upon them (as the Journal of Economics and Finance has done). The current model has an author's poor writing abilities subsidized by those who pay for the journals. That is, in journals which have substantial copy editing costs (rewriting articles), those costs are borne by the subscribers. Readability improves a journal's quality, and so to obtain the 'idea' many journals expend resources on copy editing and rewriting submitted articles. To pay for those resources, the S/SL/PPV model is appropriate. It matters not whether it is a for-profit or non-profit publisher, rewriting costs and must be compensated.

With a FAEJ, such costs can not be recovered directly. An author submitting to a FAEJ would be required to submit well written articles, and would have to bear the cost of writing well (possibly hiring copy editors). If that is the case with a FAEJ, then authors with poor writing abilities would certainly submit to S/SL/PPV because poor writing would not bear a direct cost to the author. This behavior is very similar to choosing between a journal that has author page charges and hence a lower subscription price and a journal that does not have page charges and a higher subscription price. The reader prefers the lower subscription price while the author prefers the journal with the higher subscription price. Odlysko (1998) offers an example:

"As an extreme example, in the late 1970s, Nuclear Physics B, published by Elsevier, took over as the "journal of choice" in particle physics and field theory from Physical Review D, even though the latter was much less expensive. This happened because Physical Review D had page charges, and physicists decided they would rather use their grant money for travel, postdocs, and the like. Note that the physicists in this story behaved in a perfectly rational way. They did not have to use their grants to pay for the increase in library costs associated with the shift from an inexpensive journal to a much pricier one. Furthermore, even if they had to pay for that cost, they would have come out ahead; the increase in the costs of just their own library associated with an individual decision to publish in Nuclear Physics B instead of the less expensive Physical Review D (could such a small change have been quantified would have been much smaller than the savings on page charges. Most of the extra cost would have been absorbed by other institutions."

Our point is that the individual incentive for the perfectly rational author is to select the publication method that has the lowest out-of-pocket cost to the author. Shifting costs of well-written articles from the journal to the author may be efficient since subsidization is never efficient, but it is not rational for an author to incur costs which she can shift elsewhere.

In sum, authors will have little incentive to submit to FAEJ. The extant reputation of S/SL/PPV journals and publishers draws authors who desire that reputation. Costs of publication that are shifted onto authors by FAEJ will be avoided. And FAEJ may impose some (slight) additional costs on authors by readers who do not further the authors goals.

Editors

We will separate editors into two groups: editors of extant journals (EE) and editors who are starting a new journal (NE). To save a miniscule amount of space, we label them EE (extant editors) and NE (new editors). Saving space in a hard copy journal is cost efficient and it also saves the reader some time.

NEs are the starting point for a journal. Consider starting up a new journal. There is a substantial amount of work involved: getting associate editors and referees to commit their time to the new journal; attracting authors to submit to the new journal; setting up the review process; and many other activities. This work does not differ much whether the mechanism is S/SL/PPV or FAEJ. An S/SL/PPV journal has some additional costs and benefits. The additional work needed to convince an established hard copy publisher to publish the journal is traded off against the benefits that an established S/SL/PPV publisher gives an editor. Foremost among the benefits is reputation. At least as important, the S/SL/PPV publisher helps an NE accomplish the task.

An NE could use her time to be an author. That time must be compensated. The compensation is an increase in the NEs reputation, which her dean or department chair will translate into income. There may also be personal reward, similar to the personal satisfaction of doing a job well. The S/SL/PPV publisher has a proven reputation, while an FAEJ does not. Adding the editorship of a FAEJ to your vita will probably do substantially less for you than adding the editorship of a journal published by a proven S/SL/PPV publisher. However much a department chair or even a dean would like to consider the tradeoff between the reduced cost of an FAEJ versus a S/SL/PPV journal, the savings to the university itself is quite small and the reputation factor quite large. Except for the few persons who gain personal reward in publishing an FAEJ, NEs will rationally choose an S/SL/PPV mechanism as an outlet for their editing efforts to improve their reputations.

There are added benefits of an S/SL/PPV publisher. First, the editor is not alone - the publisher, with experience in creating journals and publishing journals, can provide significant help in getting the journal started. Second, the S/SL/PPV publisher, wanting either profits or viability, will expend some effort to insure the success of the journal. One manifestation of this effort is in marketing the new journal. Just because a FAEJ exists does not mean that anyone will know about it. Marketing is as important in bringing a new product to market as creating the new product itself. In the S/SL/PPV model, marketing must be done to acquire revenue via personal and institutional

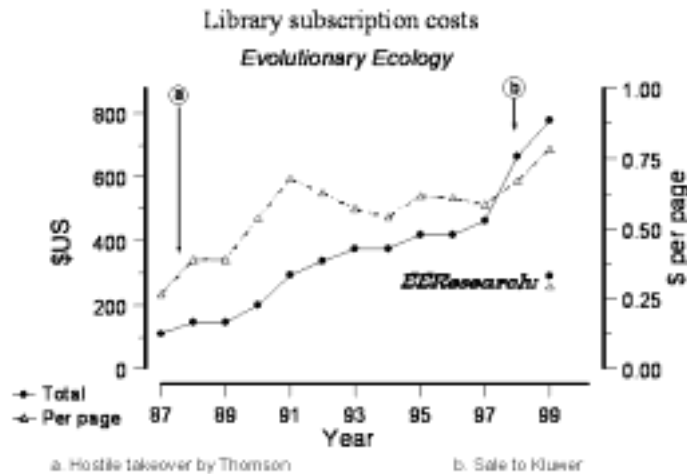
subscriptions. That, as a direct or side product, increases readership. For an FAEJ, marketing only acquires readership, and the marketing can not involve the out of pocket costs of hard copy mailing of glossy circulars extolling the virtues of a new journal. An NE must choose between self-marketing the FAEJ or letting the extant S/SL/PPV publisher do it for her.

There are many other things that an S/SL/PPV publisher does - even obtaining an ISBN can be a time consuming effort for a NE that has never done it before. The choice between doing it your self or having a publisher do it for you seems clear enough. Few NEs will choose the FAEJ model.

The EE has little incentive to divorce the S/SL/PPV unless some irreconcilable problem has occurred. Although divorces do happen, they are rare. If there are no irreconcilable problems, then there is no divorce and EEs have no incentive to change the system. In fact many EEs are paid and even though that payment itself is not at market rates, it is higher than a FAEJ can pay. Such payments make divorce even more unlikely.

But suppose there are grounds for divorce. A new partner must be chosen. Now we are almost back to the choices for an NE. However, with a successful journal title (or editing reputation) a divorced EE can bargain with other S/SL/PPV publishers and gain a greater reward than the last marriage to an S/SL/PPV publisher. Only in cases in which the EE has become so dissatisfied with any marriage partner will she remain single and edit in the FAEJ model.

Such a divorce did happen with *Evolutionary Ecology*. The editor, Michael Rosenzweig, became extremely dissatisfied with the publisher, who originally was Chapman-Hall (Rosenzweig, 1999). They were acquired by International Thomson Corporation who were later acquired by Wolters Kluwer. Rosenzweig states "*I never signed an agreement with Chapman & Hall — our relationship was based entirely on old fashioned trust.*" One can see the reason for the divorce in a graph of the library subscription rate, knowing that Rosenzweig cared so much about the cost of the journal. He says "*My dream of lower prices changed from fantasy to foolishness. There was ever reason to expect further price inflation.*" It is doubtful that Rosenzweig could have been 'bought' by Kluwer but there was certainly room for bargaining. According to Rosenzweig, the journal cost about \$80,000 to produce while the revenue was on the order of \$250,000. A smart publisher would have known the editor and his preferences and would have done something to keep him on board. There are many things besides direct remuneration that can keep an editor or attract a new one - graduate assistantships, summer support, societal support, conferences, etc. None of those were done in this case and Rosenzweig, and his editorial staff and the manuscripts jumped. However, *Evolutionary Ecology* still exists, Juha Tuomi is the Editor, and among the associate editors we find Leiden and Utrecht in the Netherlands, Duke in the US, Bath, Oxford and Cambridge in the UK, etc. Whether it is a lesser journal now compared to then is an open question.



So, opposed to Harnad's thought, we doubt that EEs will jump ship. Possibly they may argue the S/SL/PPV publisher into lower prices and less profit but it is far more likely that they will extract more of the economic rents from their particular journal, either as direct remuneration, or indirect via such things as conferences or other support. And NEs, given the opportunity to edit an S/SL/PPV journal, will choose that over an FAEJ. Even Rosenzweig states "*It's all been great fun. Nevertheless, I have a feeling it will not attract too many of my fellow editors.*"

Thus even though editors may wish, *ceteris paribus*, for more readers and free availability, their personal incentives are strongly aligned with the S/SL/PPV publisher. We imagine only two kinds of FAEJ editors - those who have divorced an S/SL/PPV and, due to their experience in that marriage, never want to marry another S/SL/PPV publisher; and those who could not convince an S/SL/PPV publisher to publish their journal. There will be relatively few high quality FAEJ editors.

Referees

Referees are uncompensated (except for token payments). Their compensation is service to the profession, an unverified entry on the vita, and possibly reciprocity from editors. The reciprocity can take many forms --- kinder treatment by the editor of their own article submissions, invitations to prestigious meetings, and letters of recommendation. This reciprocity is very indirect. No one gets a letter from an editor saying "*Great job. Please tell your dean that I want her to pay you more because this was such a great referee report.*" All of the indirect benefits depend on the reputation of the editor and the journal.

Certainly we can imagine a case in which an editor of great reputation has started an FAEJ (just because it can be done) and is able to get good referees. But that will be the rare case. More likely a referee would have to choose between an extant S/SL/PPV journal and an FAEJ. If both requests arrive at the same time, the choice is clear. Whatever indirect benefits there are to writing a referee report, they must be higher with an S/SL/PPV journal than with a FAEJ. If the S/SL/PPV arrives first, then when the

FAEJ arrives the referee can easily decide that enough effort on refereeing this year and refuse the FAEJ. If the FAEJ arrived first, it is possible that the referee, with no requests yet this year, would referee the article for the FAEJ. But a piece of the reciprocity is missing since we argued that authors would not submit to FAEJ. Hence the referee does not expect kinder treatment of her submission to the FAEJ since the author is not submitting to the FAEJ. There is some substantial probability that the referee will reject refereeing for the FAEJ preferring in stead to wait for an S/SL/PPV article to arrive requiring her services.

Hence, even if editors jumped ship, it will be hard for them to get referees for their submissions.

Readers

I believe that most academics have enough computing hardware on their desks to be able to read electronic journals. However, most academic readers were raised on printed copy and reading electronically may be burdensome. Computers are not yet as transportable as a hard copy journal. Old habits die hard. I watch many of my colleagues print an electronically obtained article, pencil in notes, and dutifully file the printed copy rather than taking electronic notes and filing the article electronically. This is especially true for very technical articles for which electronic note taking is arduous at best. This could change but even my younger colleagues seem wed to the printed page. To quote John Cairns (1997) "*There are few pleasures in life so steadily exciting as the voyages of discovery that are made in libraries. It is the book next to the one you first reach for that makes the day and leads you to the unknown land....A Persian proverb says that time spent fishing is not deducted from your life-span. Somehow I feel that time spent in a library may actually be added on.*" The point is that readers do not necessarily want FAEJ, especially if they can have S/SL/PPV without giving up their office or phone or secretarial services. Hence there is some reluctance for electronic journals on the part of readers, be they FAEJ or S/SL/PPV.

Readers do care about free availability. But will they demand FAEJ versus S/SL/PPV? Free availability to readers is no out-of-pocket costs. Their costs in the Gutenberg era were either going to the library to read the article or subscribing themselves, which also means that they have shelving costs, etc. If the library does not have the article, a subscriptionless reader must wait for inter-library loan (or some other agent) to deliver the article. All of these costs are high.

Due to these high costs, readers are a major force to bring a new era. The demand (a better word for an economist is desire) access to every article ever written. They also want low out of pocket costs. If the library pays the S/SL/PPV for electronic availability, the reader's costs are significantly reduced compared to printed access. So long as the library pays for access, the reader is happier with electronic access. FAE provides access without the library paying and S/SL/PPV with the library paying but the reader does not know which of FAEJ or S/SL/PPV has provided access. So although the reader prefers lower costs, she also prefers that someone else pay any costs. We are left with readers demanding that libraries provide electronic access to S/SL/PPV, and not caring about the library budget except to demand, as they always have that the library or the university provide the reader with all the extant knowledge possible.

Deans and department chairs

Deans and department chairs are the administrators who in part determine promotion, tenure and compensation. Publishing is the major activity in research universities. A department chair will have a better perception of the quality of different journals than a dean, but certainly not a perfect one. In fact, valuing an article, for the purpose of tenure, promotion, and compensation, is difficult at best. Deans probably rely upon department chairs in determining the quality tradeoff between different journals. In determining the value of an article, the trade-off between FAEJ and S/SL/PPV for a department chair or a dean is a simple matter of reputation. With editorial boards of equivalent reputation, S/SL/PPV is preferred since it brings the reputation of the publisher with it.

With rational expectations, deans and department chairs would question why an editorial board would choose FAEJ over S/SL/PPV. On average and without further knowledge they would conclude that it must be the case that the S/SL/PPV publishers had rejected the editorial board, or that the editorial board would not invest the time and effort needed to get an S/SL/PPV publisher. In the first case, FAEJ must be deemed to be less quality. In the second case, deans could rationally expect that FAEJ had equal or better reputation, unless deans further question the editor's decision to be FAEJ. If editors desire to provide a certification and hence quality, and given that providing it with S/SL/PPV is a much less noisy situation, deans will believe that quality editors would choose S/SL/PPV publishers since they (the publishers) bring reputation with them. Deans and department chairs would then conclude that FAEJ must be lesser quality, since if the editors were the same quality, they (the editors) would have chosen S/SL/PPV. This is similar to the market for lemons - where the analogy is that FAEJ might be good, but the rational market perception must be that they are lemons.

There are of course other avenues of information about the quality of journals including the citation indices, personal knowledge, etc. In the case of *Evolutionary Ecology Research*, most would know of the story of the editorial board jumping ship. But faced with 38 electronic journals in mathematics, in different sub-disciplines, a department chair would have to value an S/SL/PPV more than a FAEJ unless the department chair researches each of those journals. My point is simply that the reputation an extant S/SL/PPV publisher brings to a journal will sway department chairs and deans to value those articles more highly.

The resultant equilibrium

We have argued that all the players in the game of academic publishing have incentives to remain with the S/SL/PPV publishers. Of course some of the players will not remain, and maybe even some entire disciplines will not. Mathematics has 38 electronic journals - most other disciplines have none. Physics has arXiv.org where for some sub-disciplines all of the literature of the last 10 years is available for free. But all of the S/SL/PPV journals remain in physics and in mathematics. Although scientists can avail themselves of much of the scientific literature (in these areas) for free, the serials crisis remains. We have argued that none of the actors - librarians, publishers, authors, editors, referees, deans, universities - have incentives (individually) to change the current system.

If all the actors agreed to change will FAEJ become a reality. That might happen due to shared values. However, such a 'sun-spot' is as likely as not. If all deans (across universities) agreed to stop buying S/SL/PPV journals, FAEJ would be a reality. However, deans are very reluctant to even talk about 'collusion' due to law suits. Authors might 'collude' - however the rewards for such collusion (reduced library budget demands) are probably miniscule. Note that very recently over 25,000 scientists signed a letter requesting that journal publishers 'free the literature' six months after publication. Even if journal publishers do this, the serials crisis is not solved (and could be worsened due to more canceled subscriptions and resultant increases in prices). Harnad's goal of freeing the literature may happen. But it will, if we are correct, exist along with the current S/SL/PPV journals.

Our conclusion is that academic publishing apparently is 'gripped' in a path dependent equilibrium, one in which the serials crisis will be present forever.

References:

- Boyce, P B, 1997, Costs, Archiving, and the Publishing Process in Electronic STM Journals, *Against the Grain*, v. 9 (5), p. 86, Nov 1997
- John Cairns, *Matters of Life and Death*, 1997, Princeton University Press, N
- Goffe, W. L. and Parks, R. P., 1997, The Future Information Infrastructure in Economics, *Journal of Economic Perspectives*, 11(3), pp. 75-94 1997
- Harnad, S, 1998 Learned Inquiry and The Net: The Role of Peer Review, Peer Commentary and Copyright, *Learned Publishing* 11(4) pp. 183-192
- Harnad, S., Varian, H. & Parks, R. (2000) Academic Publishing in the Online Era, *Culture Machine: The Journal*, 2
<http://culturemachine.tees.ac.uk/cmach/launchpad/Articles/art_harn.htm>.
- Jog, V. 1995, Cost and Revenue Structure of Academic Journals: Paper-based versus E-journals, <<http://www.schoolnet.ca/biz/economics/vijayjog.html>>
- Joyce, P., 1990, Price Discrimination in 'Top' Scientific Journals, *Applied Economics*, 22 (8), pp. 1127-35.
- Loughner, W. 1999, Top Ten Science Publishers take 76 Percent of Science Budget, *Newsletter on Serials Pricing Issues*, 221 <<http://www.lib.unc.edu/prices/>>.
- Mitchel, T J, 1999, EBSCO Year 2000 Price Projections, *Newsletter on Serials Pricing Issues*, 237 <<http://www.lib.unc.edu/prices/>>.
- Odlyzko, A. 1998, The Economics of Electronic Journals, 1998, *The Journal of Electronic Publishing*, Volume 4-1, <<http://www.press.umich.edu/jep/04-01/odlyzko.html>>
- Rosenzweig, M L ,1999 Reclaiming What We Own: Expanding Competition in Scholarl Publishing, *The Citizen's Page of Evolutionary-Ecology*, <<http://www.evolutionary-ecology.com/citizen/reclaiming.html>>).
- Tenopir, C. and King, D. W., 2000 *Towards Electronic Publishing*, SLA Publishing, Washington, D.C.