

Exit and Voice in Scholarly Publishing

Joshua Gans

Draft: 15th December 2013

There are long-standing and increasing concerns about the exercise of market power by scholarly publishers. With digitisation, libraries are no longer subscribing to new issues of a journal but to access to the entire back catalog. As a result, this change is left them in a poorer negotiating position with respect to the pricing of those journals. On the other side of the market, academics continue to provide services to those journals for free. Authoring, editing and refereeing are typically done with no or very little payment. This continues as service to science but those academics are also concerned about impact which can be limited by high prices for access to scholarly research.

This has resulted in several waves of academic protest with regard to the exercise of market power by scholarly publishers. A decade ago Ted Bergstrom (2001) outlined the strange economics behind academics providing free services to journals who then sell them back to their own institutions at high prices seemingly independent of how cheap key inputs are. In 2006, the editors of the Elsevier published journal, *Topology* resigned over the pricing issue eventually causing the journal to cease publication entirely in 2009 after competition from an independent *Journal of Topology*. More recently, mathematician and Fields medallist, Tim Gowers, raised the issue again and called for the creation of a website where academics could publicly nominate the services they would withhold from Elsevier. That website — <http://thecostofknowledge.com/> — has generated over 14,000 academics since it was launched in 2012. Elsevier did respond in terms of withdrawing its support for legislation encouraging open access to journals and also making past mathematical research open access.¹

¹ In December 2013, Nobel laureate in medicine, Randy Schekman, announced he was boycotting *Science*, *Cell* and *Nature* due to what he argued was their poor effect on incentives to publish high quality research. This is not an issue related to market power and so will not be the subject of this paper.

These cases have in common a boycott that simply withdraws services for existing for-profit journals. However, in this paper, I evaluate whether a boycott is the correct response given that much of past knowledge remains under the control of for-profit publishers. For this I construct the frame the problem relying on Albert O. Hirschman's distinction between *exit* (akin to the boycotts enacted) and *voice* (that I will argue is akin to negotiating within the system).

A vexing issue for economists is how to think about the discipline of power. As stressed by Hirschman, the tendency is to place weight on the discipline of the market; specifically, the withdrawal of services. This is the so-called *exit* option. When a consumer is dissatisfied with goods and services, they take their business elsewhere. When an employee is satisfied with their wages and working conditions, they move to another position. If this happens often enough or by someone important enough, change might occur. Either the organisation changes or it ceases to be. But, in reality, the use of exit as a discipline device can itself be weak. In effect, it depends on the power of the individual in an individual-organisation coalition. If the alternative options open to individuals are themselves poor, then even if they are able to choose to exit, they have no incentive to do so.

To Hirschman, an alternative to exit was *voice* — or in modern markets, complaints. This arises when individuals express their dissatisfaction by raising a voice to issues while continuing to remain with or to purchase from an organisation. Voice had its own problems. First of all, it was costly to the individuals. Second, it may be vacuous if it could not be backed up with some sort of power. This may be the power to exit (in which case voice is not substitute) but it could be the power of voice to cause other problems that harm the decision-makers in an organisation. But when exit options were poor, voice could be an effective residual.

The interplay between exit and voice becomes more subtle when one considers the differences between individuals in their incentives to rely on one device or the other. For example, consumers who are most likely to exit following dissatisfaction are also those who receive the least consumer surplus from a product (that is, they are the marginal consumers). By contrast, those consumers

most likely to exercise voice are those with the highest consumer surplus (i.e., the infra marginal consumers). Thus, in consumer situations different agents will exercise different options and these might reinforce one another. However, it is sometimes the case that those who have the greatest ability to inflict damage on an organization by exit are those who also have the most to gain by engaging in costly voice options. In this case, the two devices would not coexist easily.

In this paper, I will examine this using a formal economic model. That model is presented in Section I. Its novelty is that it explicitly distinguishes between the past and new stock of knowledge/papers. Section II then considers exit and voice as options. Exit is modelled as the withdrawal of services by editors. Voice is modelled as an engagement in direct negotiations over price with exit as an outside option. In addition, exit involves launching a new open access journal for new research. The final section examines what this model implies

I. Model of Scholarly Publishing and Market Power

Here I consider a simple model of publishing based on that provided by Jeon and Rochet (2010). The core output of a journal are papers that have impact. The impact of a paper depends on its quality, q (where q is assumed to lie between 0 and 1/2) and the number of people who can access the paper, n . The utility function of a paper reader is $q + t - p$ where t is a random parameter distributed uniformly on $[-1/2, 1/2]$ (representing the distribution of readers) and p is the price of accessing the paper. Thus, $n(q,p) = q - p$.

Authors of papers care about the impact of their paper, $qn(q,p)$. It is assumed that the stock of past papers is X and the flow of new papers is x . Otherwise, authors play a passive role in determining x . Editors (and referees) also care about impact but also have costs associated with

evaluating the flow of papers. If that flow is x , then their costs are cx . Thus, assuming they have no other alternatives, so long as $qn(q,p) > c$, editors and referees will contribute.²

Given this, consider first a publisher who can unilaterally choose p to maximise profits. Assume that authors have a single outlet to consider and so cannot substitute away. If there are no other costs associated with publication then the publisher chooses p to maximise $p(q - p)(X + x)$ which gives $p^* = \frac{1}{2}q$ with a total impact of $\frac{1}{2}q^2(X + x)$. However, with this price editors will only continue to contribute if $\frac{1}{2}q^2 \geq c$. Thus, for $q \leq \sqrt{2c}$, the publisher's price will be constrained to be $p^* = q - \frac{c}{q}$ if it wishes to expand its content with x more papers. Whether it chooses to do so involves comparing $\frac{1}{4}q^2X$ — its profits without new research — with $(q - \frac{c}{q})\frac{c}{q}(X + x)$ — its profits with expanded content. Expansion will be profitable if $\frac{(q^2 - c)4c}{q^4} \geq \frac{X}{X+x}$; that is, if the stock of past to future papers is relatively low.

Before considering exit and voice in the context of this model, it is useful to describe the outcome that arises under open access when $p = 0$. In this case, the total readership is q (double what it would be under pure for-profit publishing). However, it is also the case that editors will be more willing to work without pay under these conditions so long as $q \geq \sqrt{c}$. Thus, in equilibrium, more lower quality papers will be evaluated and published. This mirrors the results of Jeon and Rochet (2010).

II. Exit and Voice

As noted in the introduction, many academics dissatisfied with the market power and practices of journal publishers have advocated various boycotts of activities to encourage an open access model. In the context of the model here, whether it be curtailing referee and editorial

² As Engers and Gans (1998) note the calculation is more complicated than that but I take the simple — if offered the position they will take it — view for our purposes here.

activities or authors not submitting to those for-profit journals, in each case, the impact of the boycott would be to reduce x and perhaps the quality associated with the flow of new research. To keep things simple, here I assume that the consequence of exit is to result in x falling to zero for the journal. It is assumed that the flow of new papers moves to an open access journal following such exit.

The following proposition describes the outcomes that arise should the exit option be exercised on a pure for-profit publisher.

Proposition 1. *Under exit from a pure for-profit journal, the price of access to the past stock of research remains at or rises to $p^* = \frac{1}{2}q$ while new research is offered at zero cost. The threshold for research evaluated falls to $q \geq \sqrt{c}$.*

The proof is a straightforward comparison of the for-profit and open access options considered above. Intuitively, as the past stock of research remains under the control of the for-profit publisher. When there is low quality, the publisher's price is constrained by having to attract editors. However, when there is no need to attract editors this constraint is lifted. Thus, prices weakly rise. As noted earlier, under open access, a greater range of articles is evaluated by editors and referees.

I now turn to consider voice. Voice here is modelled as the editors engaging in a negotiation with the publisher over price in the shadow of an exit option. In this model, the editors negotiate with the publisher (as per Nash bargaining) over the price charged by the publisher for access to the journal's articles. The outside options in that negotiation are the for-profit outcomes for the publisher who charges for access to the past stock of research and the expected impact of that past research given the unconstrained price charged by the publisher for the editors.

Given this set-up, the following proposition characterises whether voice is an equilibrium.

Proposition 2. *There are always positive gains from trade between the publisher and editor.*

All proofs are in the appendix. Intuitively, the editor will only deal with the publisher if the price charged for journals is low enough relative to taking new papers to an open access option; hence,

the condition in the proposition which relies on their being a sufficiently high stock of past to future papers. By contrast, the publisher will only deal with the editor for a price less than the unconstrained for-profit price if the flow of new papers is sufficiently high. In the latter case, when the stock of new papers is sufficiently low, the negotiated price converges to the monopoly price while, in the former case, if the stock of new papers is very high, the negotiated price converges to the open access price.

If there are gains from trade, the following proposition characterises the resulting price.

Proposition 3. *The negotiated price is (weakly) less than the pure for-profit price and is strictly increasing in q , non-decreasing in X , non-increasing in x and independent of c .*

Intuitively, as q rises the value to editors (who appropriate the entire impact of the paper) rises more than the value appropriated by publishers. Hence, the negotiated price rises to compensate the publishers. The same intuition holds for X . For x , it can be demonstrated that as the flow of new papers rises, the publisher benefits by more than editors who bear the costs of evaluating those papers. Thus, the negotiated price falls as the share of new to existing papers rises. Finally, the negotiated price is independent of c because, regardless of outcome, the editors will end up evaluating new papers.

III. Implications for Activism

I now turn to consider the implications of the above formal analysis for the type of activism that has been suggested. In so doing, I follow the comprehensive list provided by Bergstrom (2001).

The first set of activism suggested by Bergstrom (2001) was to improve the outside options available to academic authors as journals. He pointed to non-profit journals and also new electronic journals³ as options. Above I assumed that an open access option was freely available. If these were not available, this would weaken the outside options of editors and hence, diminish the impact of

³ Somewhat ironically Bergstrom suggested the, then new, journals launched by BE Press as an alternative. However, in 2011, BE Press sold those journals and their past stock of papers to a for-profit publisher who promptly placed them behind a paywall.

both exit and voice on welfare. Thus, expanding opportunities in this regard is helpful to editors even if they are not actually exercised.

That said, another way of considering the entry of new journals is that they have a direct impact on x , the flow of new papers (or their quality) to the existing journal. As Proposition 3 demonstrates, this will weaken voice options for editors and result in a rise in price of the existing stock of papers and a reduction in their impact. Thus, it is not clear that this would be a positive outcome for welfare.

Bergstrom also evaluated whether editors should resign, authors (especially senior ones) should boycott certain publications and whether referees should tailor their decisions based on the pricing practices of journals. Boycotts will lead to either a reduction in x or a fall in the average quality of new papers to existing journals. When voice is an option as modelled above, such boycotts will not be as favourable an option to editors, authors and referees than a negotiated outcome. Indeed, Bergstrom alludes to this stating that: “[a]fter difficult negotiations, the editors of the *American Journal of Physical Anthropology* convinced their publisher, Wiley, to reduce the 2001 price of the journal from \$2085 to \$1390 per year.” Thus, these editors utilised voice rather than exit to potentially good effect. When there is a stock of existing knowledge, that effect can be to improve access outcomes to that stock. A similar set of criterion applies to actions by authors and referees.

Ultimately, the model suggests that the most powerful way of reducing the market power of scholarly publishers and the impact of research published would be to reduce X ; the stock of existing knowledge they have control over. At the moment, scholars do not engage sufficiently in keeping pre-prints in open repositories (Bergstrom and Lavaty, 2007). This means that publishers continue to have a monopoly over access to that past cost. Moreover, there is scope for academics to improve upon the published work. After all, that work is optimised for print whereas much of the

research will be accessed digitally in the future. As I have argued elsewhere,⁴ there is scope to use digital tools to create articles that other academics will want to read and access more than those being provided by traditional publishers. Just as it does not violate licensing agreements to put working papers on the web, it would not violate those agreements to put post-publication papers in a completely different format to published research online. This would effectively reduce X and the long-term monopoly power of publishers that grows with each new issue published.

⁴ <http://contributioneconomy.net/2012/11/21/how-an-academic-article-of-the-future-should-look/>

Appendix:

Proof of Proposition 2

Note that, under exit, the publishers earn $\frac{1}{4}q^2X$ while editors receive a payoff of $\frac{1}{2}q^2X + (q^2 - c)x$ because new papers move to open access. If editors exercise voice and negotiate prices in the shadow of exit, then price is chosen (using Nash bargaining) to maximise $(p(q-p)(X+x) - \frac{1}{4}q^2X)(q(q-p)(X+x) - q^2(\frac{1}{2}X+x))$.

To explore whether there are gains from trade, observe that for the publisher, the price must be sufficiently high. Specifically:

$$p(q-p) \geq \frac{1}{4}q^2 \frac{X}{X+x} \Rightarrow p \geq \frac{q}{2} \left(1 - \sqrt{\frac{x}{x+X}}\right)$$

While for the editor it must be sufficiently low:

$$q(q-p)(X+x) - xc \geq q^2(\frac{1}{2}X+x) - xc \Rightarrow p \leq \frac{\frac{1}{2}qX}{X+x}$$

There are no gains from trade if, $\frac{q}{2} \left(1 - \sqrt{\frac{x}{x+X}}\right) > \frac{\frac{1}{2}qX}{X+x} \Rightarrow \frac{x}{x+X} > \sqrt{\frac{x}{x+X}}$ which never holds.

Proof of Proposition 3

Assuming there are gains from trade, solving the Nash bargaining problem above gives:

$$\tilde{p} = \min \left[q \frac{2x+3X - \sqrt{x(4x+3X)}}{6(x+X)}, \frac{\frac{1}{2}qX}{X+x} \right]$$

For the last inequality, it is straightforward to show that $q \frac{2x+3X - \sqrt{x(4x+3X)}}{6(x+X)}$ is less than $q/2$.

The remainder of the proposition comes from taking the derivative of \tilde{p} with respect to each variable and noting the sign.

References

- Bergstrom, T.C. (2001), "Free Labor for Costly Journals?" *Journal of Economic Perspectives*, 15(4), pp.183-198.
- Bergstrom, T.C. and R. Lavaty (2007), "How often do economists self-archive?"
- Engers, M. and J.S. Gans (1998), "Why Referees Are Not Paid (Enough)," *American Economic Review*, 88 (5), pp.1341-1349.
- Gowers, T. (2012), "Elsevier - my part in its downfall," *Gowers's Weblog*, <http://gowers.wordpress.com/2012/01/21/elsevier-my-part-in-its-downfall/>.
- Hirschman, A.O. (1970), *Exit, Voice and Loyalty: Responses to Decline in Firms, Organizations, and States*, Harvard University Press: Cambridge (MA).
- Jeon, D-S. and J-C. Rochet (2010), "The Pricing of Academic Journals: A Two-Sided Market Perspective," *American Economic Journal: Microeconomics*, vol. 2, n. 2, May 2010, p. 222-255.