

Electronic subscriptions to scientific journals:  
a boon for whom?

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Scientific publishing is rapidly shifting from a paper-based to an electronic distribution system, in which universities purchase *site licenses* for online access to journal contents. While this reduces publishers' production costs and offers increased convenience to readers, the academic community may actually suffer, as these new distribution technologies provide commercial publishers with more effective means of price-discrimination.

Libraries must pay dramatically higher prices for paper subscriptions to commercially-owned academic journals than to journals owned by professional societies and university presses. In the field of ecology, for example, commercial publishers' prices average about 5 times as high *per page* and about 15 times as high *per citation* as prices of non-profit journals. A similar pattern is found throughout the sciences (Table 1) and even among the 50 highest impact non-review journals in the sciences (Figure 1). These prices do not reflect quality differences as measured by citation rate; differences in price charged per citation consistently differ by an even greater margin.

The shift from paper-based to electronic publication offers tremendous convenience to users, and significantly reduces distribution costs. This shift is so recent that consistent patterns of pricing have yet to be established, but trends in the prices of paper subscriptions provide a likely indicator of future trends in electronic subscription pricing. Supported by university site licenses, non-profit journals will likely pass on much of the benefits of reduced distribution cost to the academic community. Commercial publishers are less likely to do so, and indeed many currently offer electronic subscriptions without print for about the same price as print alone. Since commercial publishers' pricing of paper subscriptions was not determined by cost, it is unsurprising that a major reduction in production costs has not generated a similar reduction in subscription prices.

Moreover, new distribution technologies and licensing systems may allow commercial publishers to practice forms of price discrimination that — despite the increased convenience and lower production costs — actually *reduce* the net benefit that the academic community realizes from their journals. For paper journals, publishers dared not charged higher prices to large libraries than to smaller ones. As a consequence, libraries at large research universities have benefitted from the fact that commercial publishers face the traditional monopolists’ problem. If publishers raised their prices to the full amount that large libraries would be willing to pay for subscriptions, they would lose the subscriptions of intermediate-sized libraries. Thus publishers typically set prices high enough to shut out smaller libraries, but not so high as to exclude libraries of intermediate size. Large libraries then get some “consumer’s surplus” by buying subscriptions at prices below the maximum they would be willing to pay.

This situation is changing with electronic publishing. Derk Haank, CEO of publishing giant Elsevier Science, states that Elsevier intends to actively pursue price discrimination in its electronic site licenses: “And, basically the price then depends on a rough estimate of how useful is that product for you; and we can adjust it over time....We want to distinguish between big universities vs. small universities, corporate vs. universities, and maybe rich countries vs. developing countries” [6]. Elsevier currently implements this policy by offering electronic site licenses for bundles of its journals to consortia of universities, where the price to each consortium is negotiated separately, depending on total willingness to pay.

Ken Frazier, head librarian at the University of Wisconsin argues university libraries in general will not benefit from purchasing bundled site licenses from commercial publishers: “Academic library directors should not sign on

to the Big Deal or any comprehensive licensing agreement with commercial publishers . . . the Big Deal serves only the Big Publishers . . . increasing our dependence on publishers who have already shown their determination to monopolize the marketplace.”[5]

Economic analysis [2] suggests that the university community would be better off if university libraries were to refuse to purchase journal site licenses at prices that substantially exceed the publisher’s average cost. Commercial publishers seeking to maximize their profits would then either have to sell site licenses at prices closer to their actual costs, or resort to selling electronic access to individuals on a pay-per-view basis. Although the former arrangement is more efficient than the latter, either of these two outcomes would result in greater net benefits for the scientific community than does the current policy of purchasing university-wide site licenses at university-specific prices chosen by profit-maximizing publishers.

The scientific community would also benefit if overpriced journals were displaced by journals committed to pricing approximately at average cost. This suggests that non-profit professional societies and university presses could do a great service to the academic community by expanding their existing journals or starting new ones. Individual scholars could advance this process in many ways: by contributing their time and efforts to the expansion of these non-profit journals, by refusing to do unpaid referee work for overpriced commercial publications, and by favoring reasonably priced journals with their submissions.

## References

- [1] C. T. Bergstrom. Unpublished data.
- [2] C. T. Bergstrom and T. C. Bergstrom. Do electronic site licenses for academic journals benefit the scientific community? 2001. UCSB Economics Working Paper No. 15-01. <http://www.econ.ucsb.edu/>.
- [3] Theodore Bergstrom. Free labor for costly journals? *Journal of Economic Perspectives*, to appear, 2002.
- [4] Patty Carey. Per page cost of atmospheric science journals. online at <http://www.lib.washington.edu/subject/atmosphericsci/scholcom>, Sept 2000.
- [5] Kenneth Frazier. The librarian's dilemma: Contemplating the costs of the "Big Deal". *D-Lib Magazine*, 7(3), March 2001.
- [6] Derk Haank. Is electronic publishing being used in the best interests of science? The publisher's view. In *Proceedings of the Second ICSU-UNESCO International Conferences on Electronic Publishing in Science*, 2001.
- [7] American Mathematical Society. AMS journal price survey. Online at <http://www.ams.org/membership/journal-survey.html>, 2001.
- [8] George Soete and Athena Salaba. Measuring journal cost-effectiveness: Ten years after Barschall. University of Wisconsin-Madison report. Online at <http://www.library.wisc.edu/projects/glsdo/cost.html>, 1998.

	Cost per page (\$ US)		Cost per citation (\$ US)	
	For-profit	Non-profit	For-profit	Non-profit
Ecology	1.01	0.19	0.73	0.05
Economics	0.83	0.17	2.33	0.15
Atmosph. Sci.	0.95	0.15	0.88	0.07
Mathematics	0.70	0.27	1.32	0.28
Neuroscience	0.89	0.10	0.23	0.04
Physics	0.63	0.19	0.38	0.05

Table 1: Average journal cost per page and cost per citation by scientific field. Citation data are from the Institute for Scientific Information’s *Journal Citation Reports*. Journal lists, pricing, and page data are from refs. [1, 3, 4, 7, 8].

