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# Scholarly Journals Should be Treated as a Public Good

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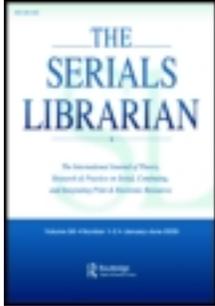
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### Scholarly Journals Should Be Treated as a Public Good

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# *CONCURRENT SESSIONS*

# Scholarly Journals Should Be Treated as a Public Good

Steve Black

*Presenter*

*Note: This paper was presented in a concurrent session with Dr. Keith Seitter, entitled "Scholarly Publication: Business and Public Good?"*

**SUMMARY.** The thesis that scholarly journals should be treated as public goods is based on five arguments. First, scholarly journal articles have many public good characteristics, and many of their private good characteristics are created by choice. Second, our current system undersupplies students with scholarly journals. Third, the supply chain for journals from publisher to user is burdened by many deadweight losses. Fourth, online publishing might reduce those deadweight losses enough to fund a system freely available to scholars. Finally, treating scholarly journals as public goods can meet the needs of all stakeholders. Explanations of the economic concepts of public good, deadweight loss, and Pareto optima are given to support the arguments. *[Article copies available for a fee from The Haworth Document Delivery Service: 1-800-HAWORTH. E-mail address: <docdelivery@haworthpress.com> Website: <<http://www.HaworthPress.com>>]*

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Online scholarly periodical literature naturally lends itself to be treated as a public good. Public goods are consumer goods that, when made available to anyone, can be made available to others at no additional cost. Since essentially all public goods have private goods characteristics, collective choices are made to treat schools, roads and other things with social value as public goods. While aggregations of producers' journals into large databases and organization of libraries into consortia are moving us in the direction of treating scholarly journals as public goods, we are in danger of creating an oligopoly that fails to adequately serve the needs of publishers, libraries, and scholars. Market forces alone will not adequately fund the social value of scholarly publications. The stakeholders in scholarly publishing should investigate what it would take to create an adequately funded, equitable system that serves all scholars as efficiently and effectively as possible.

My thesis that scholarly journals should be treated as public goods is based on five arguments. First, scholarly journal articles have many public good characteristics, and many of their private good characteristics are created by choice. Second, our current system undersupplies students with scholarly journals. Third, the supply chain for journals from publisher to user is burdened by many deadweight losses. Fourth, online publishing might reduce those deadweight losses enough to fund a system freely available to scholars. Finally, treating scholarly journals as public goods can meet the needs of all stakeholders.

***SCHOLARLY LITERATURE HAS MANY PUBLIC GOOD  
CHARACTERISTICS, AND MANY OF ITS PRIVATE GOOD  
CHARACTERISTICS ARE CREATED BY CHOICE***

Since we have only recently reached the point where the infrastructure in the U.S. allows convenient online delivery of journal articles to end users, path dependency has carried a print pricing model into a new market where it may not fit. Print journals, by their nature, have private good characteristics that must be artificially recreated online.

As stated earlier, a public good is a commodity or service that if supplied to one person can be made available to others at no extra cost. A pure public good, as defined by Paul Samuelson, is non-rival in consumption (one person's consumption of the good does not reduce its availability to anyone else), and has the characteristic of non-excludability (once the good is provided the producer is unable to prevent anyone from consuming it).<sup>1</sup>

It is likely that no pure public goods exist in the real world. A typical limitation to a public good is geography. A local public good is restricted to a limited area, an example being a fireworks display or a broadcast radio station. Public goods can be limited by congestion. A roadway is non-rival and non-excludable if traffic is not heavy, but congestion reduces the road's availability to drivers. Similarly, the public good nature of volumes in a library is limited by physical access to the collection and the fact that a volume cannot be used by more than one person at a time. Since "pure" public goods are extremely rare, provision of public goods is a matter of collective choice.<sup>2</sup>

It is critical to recognize that "public good" refers to nonrivalrous, nonexcludable consumption attributes, and *not* to whether a good is produced by the public sector. For instance, a broadcast radio program is a public good. My listening to a radio station does not lessen your ability to listen (nonrivalrous), and within its range the radio station does not limit who can pick it up (nonexcludable). Whether a station's broadcast is paid for by public funds or by advertising or by government is not relevant to the broadcast being a public good. Since the source of funding is not a defining characteristic of public goods, one can accept the premise that scholarly journals should be treated as public goods without assuming anything about how or by whom the production of journals is financed.

Also worth emphasizing is that a public good need not have the same benefit to all, even though the availability is the same to all. Publicly available weather forecasts may be of more value to pilots than miners, but forecasts are still a public good. A radio station's signal is a public good, even though some people have no radio, or no desire to tune in. The fact that some people have no interest in scholarly journals doesn't affect their public goods characteristics.

Collective choice to treat something as a public good makes sense when the costs of creating the first unit are very high, but the cost of making one more unit available is very low. Typically, public goods are "lumpy." They require large up-front infrastructure expenditures greater than any individual would be willing to pay. Think of the cost of building a radio station or a library or a new interstate highway. A large lump of funding is needed for the start-up, and relatively less to produce additional units or to maintain the good.

According to an economic principle called the Pareto optimum, society as a whole derives the greatest benefit from a good when no possible reallocation of the good can make anyone better off without making someone else worse off.<sup>3</sup> The optimal, most efficient allocation of a

public good is achieved, in theory, when the total marginal cost to all consumers is equal to the total marginal cost of production. Therefore the ideal level of spending on a public good is essentially the equilibrium of costs after the “lumps” have been paid for. But since the marginal cost of producing another copy of an online journal article is trivial, publishers create online articles with basically all lump and no marginal cost. To provide articles at the Pareto optimum would be to provide them for free. So how would the first-copy costs be paid for?

Online journal articles can be public goods just as radio broadcasts are public goods. A journal article retrieved from a database is nonrivalrous, since one person’s viewing and downloading of an article does not affect another person’s ability to do the same (unless the provider imposes limits). But print journals are slightly rivalrous, since only one person can use an issue at a time, and use is limited by physical access to the volume.

A journal article online is excludable only to the degree chosen by the provider. A publisher can choose to exclude no one and make articles freely available on the Web, or a publisher can create a system that restricts access to paying users. In contrast, print journals are exclusive to those who pay subscriptions. Library subscriptions make journals less excludable, but people still have to gain physical access to the copy. The change in excludability from print to online has fundamentally upset the journals market. In the online environment, free access to journals is technologically simpler, but it doesn’t pay the bills. So publishers, of necessity, spend effort and resources to make their products excludable like print subscriptions.

Society chooses to treat something as a public good when it would be under produced without group intervention. That choice is typically made when the social value of something is recognized as being worth paying for. Information found in journals has both a primary value and a social value. The primary value is the gain individuals enjoy from using the information. The social value is the benefit to society derived from the education gained from use of the information. Unless an organization able to act in the public’s interest becomes involved, the social value of information is not funded. Public funding of education reflects the recognition of the social value of an informed populace.<sup>4</sup>

### ***OUR CURRENT SYSTEM UNDERSUPPLIES STUDENTS WITH SCHOLARLY JOURNALS***

A study of users of the *Bryn Mawr Classical Review* and *Bryn Mawr Medieval Review* showed that 65% and 45%, respectively, of users are

faculty.<sup>5</sup> It's no news that the one million college faculty members in the U.S.<sup>6</sup> are important consumers of peer-reviewed scholarly periodicals. However, that means that if *Bryn Mawr Review's* use is typical of scholarly journals, from 35% to 55% of use is by students and other scholars. There are 15,203,000 college students in the United States.<sup>7</sup> Two thirds of them work either full time or part time, and about 18% of them are over 35 years old,<sup>8</sup> so for many students finding time to access journals is difficult. The Bryn Mawr study also found 5-10% of users had no academic affiliation.<sup>9</sup> This large population of individuals who are not faculty could benefit from more convenient access to the scholarly journals they want or need to read.

Academic reference librarians know that many students feel underserved by their journal collections. We operate a gift economy, where we make our best guesses as to what the students will need to use, and purchase subscriptions for their use. Our guesses leave many patrons without the articles they would like.<sup>10</sup> The huge volume of interlibrary loan requests is concrete evidence of unmet need, and student use of journals made available online that their library never owned in print is high.<sup>11</sup>

***THE SUPPLY CHAIN FOR JOURNALS  
FROM PUBLISHER TO USER IS BURDENED  
BY MANY DEADWEIGHT LOSSES***

A deadweight loss is the gap between the price buyers pay and the price sellers receive. A market is optimally efficient when consumer surplus and producer surplus are maximized. That is, the consumer feels he's getting a good deal, and the producer makes a profit. Deadweight loss reduces market efficiency. The classic example of a deadweight loss is a sales tax. The price consumers pay for a taxed good is higher than the price received by the producers, so the tax hangs like a dead weight on the producers' income and the consumers' willingness to pay. This causes consumers to buy less, therefore reducing producers' ability to set prices as high as they would prefer.

The deadweight losses in the journal supply chain are mostly in the time and effort spent to distribute, organize, and access journals. Unlike a sales tax, these deadweight losses are not immediately apparent, and some are so diffuse as to be easily overlooked. Scholars (including students) spend enormous amounts of time accessing journal literature. Sweetland calculated that it takes 5.12 minutes to retrieve a bound journal volume, and 6.17 minutes to retrieve an article on microfilm.<sup>12</sup>

That's after the citation is in hand. If, for example, the 15 million college students in the U.S. can earn an average of \$10 an hour, and retrieve 10 journal articles per year (on average), the direct time cost alone of retrieving articles would be \$8.53 per student. That's a total of student time worth \$12,800,000 per year. That figure does not include patrons' time getting to the library, or direct and indirect costs imposed by the time spent in the library (i.e., not at work, or home with the kids, etc.). A full accounting of the deadweight loss of scholars' time spent retrieving articles in print versus downloading online articles from any Web-connected computer would require a well-designed research project.

The funds libraries spend on serials acquisition, organization, and maintenance reduces funds available to pay for subscriptions. In theory, the difference between the total cost of managing a serials collection and the price paid to publishers is the deadweight loss in the system. Having scholarly journals online will not eliminate overhead costs for libraries, but the per-title cost of maintenance can be much lower.<sup>13</sup> Over time, the shift to online access may allow libraries to shift resources from binding, reshelving, and processing to paying subscription or license fees.

The portion of publishers' total expenses for marketing, invoicing, responding to claims, and handling physical volumes also represents a deadweight loss. Research is needed to determine the price publishers would be willing to receive for their journals if they only had to pay for first copy production. The costs of activities not related to editing, peer review, and first copy production may be borne more efficiently by organizations other than publishers.

***ONLINE PUBLISHING MIGHT REDUCE  
THOSE DEADWEIGHT LOSSES ENOUGH TO FUND  
A SYSTEM FREELY AVAILABLE TO USERS***

This premise is based on a hypothetical model, where funding from library consortia, foundations, governments, and/or other organizations pays for scholarly journals. The funding would cover publishers' first copy costs, the infrastructure for access to and storage of journal content, bibliographic databases that link to the content, and a system of peer-based quality control oversight. Details of how such a system might be created lie beyond the scope of this paper. In principle, though,

considerable efficiencies can be gained by not processing physical volumes, reducing administrative costs, and saving the time of scholars.<sup>14</sup>

### ***TREATING SCHOLARLY JOURNALS AS PUBLIC GOODS CAN MEET THE NEEDS OF ALL STAKEHOLDERS***

Some aspects of a public goods model are already in place. For many years, publishers have received indirect support via subscription revenues from governments, foundations, and other bodies concerned with funding the social value of information. While the method of funding does not define a public good, the use of public funds for subscriptions through grants and library support indicate a history of public support for scholarly journals.

Consortial purchasing of online content represents a move from a market of private, excludable goods to quasi-public “club” goods. A club good is a public good made exclusively available to a defined group of users. For example, the library at The College of Saint Rose licenses access to about 800 journals in Elsevier’s Science Direct via the Pi Squared consortium. Before our participation in the consortium, we subscribed to only 10 of the titles in Science Direct. The library is paying Elsevier the same as before (plus inflation), and Elsevier is receiving the same revenue from the Pi Squared members. By treating the journals in Science Direct as a club good, Elsevier is giving the students at my institution online access to eighty times as many journals as before.

State-wide consortia are actively working to increase the online journal content available to all library users in the state, effectively making them all members of a club granted access to full-text content. Just one example of state-wide funding of a full text database is the Health Reference Center, a Gale database provided to all libraries in New York State under the auspices of the New York State Library, backed by federal funding.<sup>15</sup> While this database includes full text from other types of sources, it does include articles from many scholarly journals.

While it appears that the journal market may be moving towards a public goods model, or at least a club goods model, important needs of stakeholders are not being adequately addressed. Since there is no direct support for publishers’ first-copy costs, uncertain revenue to publishers threatens the stability of content in aggregated full-text databases. EBSCO, a leading vendor of online journals, holds the position that aggregated full text databases complement, but should not replace, indi-

vidual journal subscriptions.<sup>16</sup> Apparently, payments by full text aggregators to publishers are not sufficient to cover first-copy costs.

Smaller libraries lack the necessary resources to adequately support subscriptions to individual online journals. Because of the work involved, it is feasible for a smaller library to administer an aggregated database of a few thousand titles, but not feasible to administer access and logins through dozens of publishers to the same number of titles. Similarly, small publishers may not have the resources to provide online content in a competitive manner. Managing individual online journal subscriptions may be as costly as managing print journals.

Since there are so many publishers and vendors of online content, and therefore myriad search interfaces and methods of linking to full text, getting from citation to online full text can be quite bewildering to users. Finally, the issue of reliable archival storage of online content is not yet resolved.

While alternative models have been proposed, it is my opinion that they fall short of meeting all stakeholders' needs. Bypassing publishers is a mistake, because they deserve to be adequately compensated for the very real value they add to scholarship. The Open Archives Initiative, for instance, may work, but I do not believe it can support first-copy production of high quality articles over the long run.<sup>17</sup> However, a public goods model is certainly capable of reducing the costs to publishers not related to the first-copy costs of creating content.

Insofar as publishers set creation of high-quality content as their top priority, reducing the cost of overhead is in their interest. There are almost 2000 active, refereed, scholarly journals with library subscription rates of less than \$50, and another 1000 have rates less than \$100.<sup>18</sup> If it costs \$50 to gain a new subscriber to a periodical,<sup>19</sup> surely those publishers would be quite interested in having their first-copy costs paid for, and the content made readily and reliably available to scholars.

Librarians, working in the interest of scholars, desire to increase access to journals. This is certainly true for smaller, less wealthy institutions. Consortial deals and aggregated packages have dramatically improved student access at The College of Saint Rose, but there remains much unmet need. More disturbing is that patrons' need for journals for which we do have online access sometimes goes unmet. Each interface and method of linking to content may be rational, but our users face a very complicated system filled with potential for failed connections. To be able to assist patrons, librarians need a stable, predictable, explainable system for retrieving journal articles online. Libraries also need to

minimize the administrative overhead associated with managing access to online journals.

Scholars clearly desire access from a convenient location to as much information as possible via understandable, navigable systems that allow efficient searching.<sup>20</sup> Scholars also have a stake in maintaining, and perhaps even improving, the quality of journal content. Also important, but rarely if ever voiced, is a need to provide scholarly journals to independent and young scholars. There could be great social benefit in giving prodigies and curious laymen broad access to scholarship, to allow them to feed their curiosity with good information. After all, what good is it to tell students the great value of being life-long learners, but then tell them they have to be at a university to keep in touch with scholarship?

### CONCLUSION

George Washington believed that periodicals were “more happily calculated than any other [type of publication] to preserve the liberty, stimulate the industry, and meliorate the morals of an enlightened and free people.”<sup>21</sup> Washington wrote that in a letter expressing condolence for the financial failure of the *American Museum*. Now as then, scholarly periodicals are important; they should be more widely available, and they need to be more predictably supported.

Now that the Web enables online access, scholarly periodical literature naturally lends itself to be treated as a public good. While aggregations of producers’ journals into large databases and organization of libraries into consortia are moving us in that direction, we are in danger of creating an oligopoly that fails to adequately serve the information needs of millions of people. Market forces alone will not adequately fund the social value of scholarly journals. Publishers, librarians and all organizations that support scholarship should choose to treat journals as public goods, and create an adequately funded, equitable system that serves all scholars as efficiently and effectively as possible.

### NOTES

1. Agnar Sandmo, “Public goods,” *The New Palgrave: A Dictionary of Economics* (New York: Macmillan, 1987): 1061.

2. David W. Pearce, Ed., *The Dictionary of Modern Economics* (Cambridge: MIT Press, 1981): 352-354.

3. Agnar Sandmo, "Public Goods," 1062.
4. Benjamin J. Bates, "Information as an Economic Good: Sources of Individual and Social Value," in Vincent Mosco and Janet Wasko, Eds., *The Political Economy of Information* (Madison: University of Wisconsin Press, 1988): 76-94.
5. Richard Hamilton, "Patterns of Use for the Bryn Mawr Reviews," in Richard Ekman and Richard E. Quandt, Eds., *Technology and Scholarly Communication* (Berkeley, CA: University of California Press, 1999): 195-204.
6. The most recent data for the number of faculty in the U.S. comes from the National Center for Education Statistics, *Fall Staff in Postsecondary Institutions, 1997*. U.S. Department of Education, November 1999. Available online: <http://nces.ed.gov/pubs2000/2000164.pdf>. Table 1 in this report shows a total of 1,020,786 faculty. Table 2 indicates there are 989,813 faculty classified as "instruction/research/public service."
7. Data on number of students is drawn from "Table A-10: Attendance Status of College Students 15 years and Over," in *Education Statistics of the United States*, 3rd. ed. Lanham, MD: Bernan Press, 2001.
8. U.S. Census Bureau, "Table No. 270: College Enrollment—Summary by Sex, Race, and Hispanic Origin: 1999." *Statistical Abstract of the United States: 2001* (121st Edition) (Washington, DC: U.S. Census Bureau, 2001). Of 15,203,000 college students, 33.1% work full time, and 30.3% work part time.
9. Hamilton, "Patterns of Use for the Bryn Mawr Reviews," p. 200.
10. The potential deadweight losses associated with gift-giving are analyzed in Joel Waldfogel, "The Deadweight Loss of Christmas," *American Economic Review* 83 (1993): 1328-1337. The basic premise Waldfogel investigates is how gifts may leave recipients worse off than if they made their own choices with equal funds.
11. High use of online journals not owned in print is stated clearly by K. Mulliner, Collection Development Coordinator, Ohio University Libraries, in his letter to the Editor of *D-Lib Magazine* "The Big Deal: I Beg to Differ," April 2001, available online at <http://www.dlib.org/dlib/april01/04letters.html>. For the context of that letter, an overview of the "Big Deal" controversy, and a bibliography of the issues surrounding library consortia and online journals in aggregated packages, see Thomas A. Peters, "What's the Big Deal?," *Journal of Academic Librarianship*, 27 (2001): 302-305.
12. James H. Sweetland. "User Access Time: Hard Copy and Microfilm Compared." *Microform Review* 24 (1995): 133-137. Sweetland noted that there were very few studies of access times, and this 1995 article appears to be the most recent quantitative study of user access times.
13. The potential cost savings to libraries of online access is described well by Kevin Guthrie, president of JSTOR, in his "Archiving in the Digital Age: There's a Will, But Is There a Way?," *Educause Review*, 36, no. 6 (2001): 57-65. Available online: <http://www.educause.edu/ir/library/pdf/erm0164.pdf>
14. For an overview of potential cost savings, and a possible model for electronic publication, see Hal R. Varian, "The Future of Electronic Journals," presented at the Scholarly Communication and Technology Conference at Emory University, April 24-25, 1997. Available online: <http://arl.cni.org/scomm/scat/varian.html>.
15. Information about the New York State Library's activities to provide access to full-text databases and other initiatives, including an explanation of the role of federal funding, may be found in the Library's Division of Library Development document "Will Your Constituents Lose the Economic Advantage of 21st Century Libraries?" March 28, 2002, available online at <http://www.nysl.nysed.gov/libdev/lsta/fundlsta.htm>.

16. EBSCO's rationale behind the position that aggregated full-text databases are not a replacement for individual subscriptions is described by Sam Brooks in his "Issues Facing Academic Library Consortia and Perceptions of Members of the Illinois Digital Academic Library," *Portal: Libraries and the Academy* 2 (2002): 43-57.

17. The Open Archives Initiative and the issues surrounding its creation are described in Jean-Claude Guédon's *Oldenburg's Long Shadow: Librarians, Research Scientists, Publishers, and the Control of Scientific Publishing* (Annapolis Junction, MD: ARL Publications, 2001).

18. *Ulrich's Periodicals Directory* online, accessed February 6, 2002. Out of 16,758 records for active, refereed, scholarly journals, filtering for "<\$50" retrieved 1941 records, and filtering for "<\$100" retrieved 2913 records.

19. Shulevitz, Judith, "Eulogy for a Little Magazine," *The New York Times on the Web*, November 18, 2001. Retrieved November 18, 2001 from <http://www.nytimes.com>.

20. An overview of university student opinions about user access may be found in John Lubans' "'When I'm all alone I'm in bad company': defining the user experience," *Library Administration and Management*, 13 (1999): 167-170.

21. Letter to Mathew Carey from George Washington of June 25, 1788, cited in Frank Luther Mott, *A History of American Magazines: 1741-1850*. (Cambridge, MA: Harvard University Press, 1939).

## CONTRIBUTOR'S NOTES

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