

# Capitalizing on Competition: The Economic Underpinnings of SPARC

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Over the last 15 years the library community has been faced with high and ever rising prices for scholarly resources. A number of factors have contributed to this situation, most fundamentally, the commercialization of scholarly publishing. While libraries have tried a number of strategies to ameliorate the effects of high prices, the development of SPARC finally seems to be having some positive effects.

This paper will review the current library environment, outline the elements that contribute to a monopolistic marketplace for science, technology, and medical publishing, and then briefly discuss the various calls for more competition in the scholarly publishing market. I will then discuss SPARC, the Scholarly Publishing and Academic Resources Coalition, a major initiative intended to introduce low-priced, high-value alternatives to compete for authors and subscribers with high-priced commercial publications.

## **The Environment**

Over the past 15 years, libraries have struggled with the growing gap between the price of scholarly resources and their ability to pay. Data collected by the Association of Research Libraries (ARL), a membership organization of 121 of the largest research libraries in North America, reveal that the unit cost paid by research libraries for serials increased by 207% between 1986 and 1999.<sup>1</sup> While serial costs increased at 9% a year, library materials budgets increased at only 6.7% a year. Libraries simply could not sustain their purchasing power with such a significant gap. Even though the typical research library spent 170% more on serials in 1999 than in 1986, the number of serial titles purchased declined by 6%. More dramatically, book purchases declined by 26%. With such a drastic erosion in the market for books, publishers had no choice but to raise prices (although not nearly as high as did journal publishers). In 1999, the unit cost of books had increased 65% over 1986 costs. As points of comparison, over the

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<sup>1</sup> *ARL Statistics 1998-99* (Washington, D.C.: Association of Research Libraries), p. 9.

same time period, the consumer price index increased 52%,<sup>2</sup> faculty salaries increased 68%,<sup>3</sup> and health care costs increased 107%.<sup>4</sup>

At the same time price increases were straining library budgets, an explosion in the volume of new knowledge and new formats was adding yet more stress. According to *Ulrich's International Periodicals Directory*, the number of serials published increased over 100% between 1986 and 1999 to approximately 210,000 titles.<sup>5</sup> While the majority of these titles are not scholarly journals and would not be collected by research libraries, the data does give some indication of the health of the serials publishing industry. According to figures from UNESCO, over 850,000 books were published worldwide in 1996.<sup>6</sup> Data from the top 15 producing countries reveals that book production increased 50% between 1985 and 1996.<sup>7</sup> In the meantime, electronic publishing is booming with the number of electronic journals increasing 30 times over between 1991 and 1997.<sup>8</sup> While worldwide output of information resources increases dramatically, the research library is purchasing a smaller and smaller proportion of the available universe. The typical library that subscribed to 16,312 serial titles and 32,679 monographs in 1986, is now able to afford only 15,259 serials and 24,294 monographs.<sup>9</sup>

The overall high prices and significant price increases of journals have been traced to titles in science, technology, and medicine (STM). Price increases in these areas have averaged from 9-13% a year over at least the past decade.<sup>10</sup> Many librarians believe that the growth of commercial publishers in STM journals publishing is one of the underlying causes of the high prices. In addition, the consolidation going on in the publishing industry raises even more concerns that fewer companies with greater market power will exacerbate current trends.

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<sup>2</sup> Ibid., p. 14.

<sup>3</sup> Data from the American Association of University Professors, as reported in the *Chronicle of Higher Education*, 1985-2000.

<sup>4</sup> Data extracted from the Bureau of Labor Statistics, Consumer Price Index-All Urban Consumers, Medical Care, June 12, 2000. [www.bls.gov/]

<sup>5</sup> Data from 1985/86 taken from Ann Okerson, "Of making many Books There is No end: Report on Serial Prices for the Association of Research Libraries," in *Report of the ARL Serials Prices Project* (Washington, D.C.: Association of Research Libraries, 1989), 15; 1999 data from *Ulrich's International Periodicals Directory 1999*.

<sup>6</sup> Albert N. Greco, "International Book Title Output: 1990-1996," *Bowker Annual* (New Providence, N.J.: R.R. Bowker), 1999, pp. 548-551.

<sup>7</sup> *Bowker Annual 1991*, pp. 444-45; 1999, p. 550.

<sup>8</sup> *Directory of Electronic Journals, Newsletters and Academic Discussion Lists* (Washington, D.C.: Association of Research Libraries, 1997), p. 3.

<sup>9</sup> *ARL Statistics 1998-99*, p. 9.

<sup>10</sup> Barbara Albee and Brenda Dingley, "U.S. Periodicals Prices—2000," *American Libraries* May 2000, pp. 78-82.

The growth of the commercial presence in scholarly publishing has introduced a market economy to an enterprise that had been considered by scholars as a "circle of gifts." Scholars have always been interested in the widest possible dissemination of their work and the ability to build on the work of others. To share their findings with colleagues and claim precedent for their ideas they have been willing to give away their intellectual effort for no direct financial remuneration. Their rewards come in the form of reputation within their fields and promotion and tenure from their institutions. Scholars trusted that the publishers to whom they gave their work were operating in their best interests, intent on furthering the scholarly enterprise through wide distribution of research results.

For a long time, this arrangement worked well. Publishers helped shape the disciplines by collecting manuscripts in specific fields, managing the peer review process, and marketing and selling subscriptions. But as a few large publishers recognized the earnings potential of a constant supply of free content that must be purchased by libraries, they raised prices higher and higher eventually driving libraries to cancel subscriptions, hence decreasing access and causing additional price increases. While it may seem counter-intuitive that selling fewer copies could increase revenues, there is some evidence to suggest that this is in fact the case.<sup>11</sup> So the wide distribution desired by authors is directly opposed to the strategy used by publishers to maximize their profits.

It is important to note that commercial publishers are doing exactly what their stockholders would expect them to do. They are behaving responsibly toward their shareholders, their highest priority. This need to protect shareholder value, however, sometimes conflicts directly with the need for scholars to both distribute their own work widely and have ready access to the work of others.

## **The Monopolistic Marketplace**

Publisher profits begin to reveal the nature of the scholarly publishing enterprise, particularly that of journals publishing in science, technology, and medicine, and increasingly in business and economics. Some of the world's largest journal publishers are companies owned by Wolters Kluwer and Reed Elsevier. Data from these companies compared with that from the periodicals publishing industry as a whole, show margins 2-4 times as high and return on equity almost

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<sup>11</sup> Mark J. McCabe, "The Impact of Publisher Mergers on Journal Prices: An Update," *ARL: A Bimonthly Report on Research Library Issues and Actions from ARL, CNI, and SPARC* (December 1999): 2.

twice as high.<sup>12</sup> The science publishing division of Reed Elsevier (of which Elsevier Science is the most significant component), has seen operating margins in the last five years in the 35-40% range. For a couple of years, these operating margins were higher than those of Microsoft. These numbers suggest that scholarly journals publishers are operating in a monopolistic market.

A number of factors contribute to the monopolistic environment in which journal publishers operate. While faculty may desire to publish to share their work with colleagues, they are also driven to publish by the promotion and tenure system. Faculty will submit their articles to the most prestigious journals in their fields or to the title that will most likely accept their work. As a title gains in prestige as measured by its impact factor (the frequency with which the average article in a journal has been cited in a particular year), it becomes more and more attractive to faculty, both as authors and readers, and takes on a dominance in the field. Faculty expect their libraries to subscribe to both the prestigious titles and other second tier titles in which they publish.

Libraries, whose mission is to serve current and future scholars, purchase as many titles as their budgets will allow. With journals, their practice has been to set up a subscription which is generally not reviewed unless an event, such as an unusually dramatic price increase, draws attention to it. (It is more typical, now, however, for libraries to review all of their journal titles every year to cull out little used or no longer relevant titles.) Once in a library's journals collection, there was little chance of a title being canceled. As publishers raised prices, libraries did everything they could to protect their journals budgets. But they had also inadvertently protected faculty from the reality of journal prices. In the professionalization of collection development in the 1960's and 70's, responsibility for selection had been moved from faculty to librarians. Faculty were no longer aware of the institutional prices that were being charged for the titles in which they published and to which they expected the library to subscribe.

Yet another factor contributing to the market dynamic was the hesitancy of scholarly societies to compete with well-established titles or to launch new titles in developing fields. Launching titles in new fields or niche areas could draw papers away from established society titles jeopardizing both their clout and financial stability. Thus, authors turned to commercial publishers to support their interests. As these new journals slowly grew in size and prominence, it was

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<sup>12</sup> Brendan J. Wyly, "Competition in Scholarly Publishing? What Publisher Profits Reveal," *ARL: A Bimonthly Newsletter of Research Libraries Issues and Actions* (October 1998): 7-13; and Kaylyn Hipps, "Update on Scholarly Publisher Profits," *ARL: A Bimonthly Report on Research Library Issues and Actions from ARL, CNI, and SPARC* (December 1999): 6-7.

less and less likely that societies would take the financial risk to compete. It has been reported that it takes about six years for a new journal to break even.<sup>13</sup>

Libraries undertook a number of strategies to cope with the continuing increase in journal prices. They reduced dramatically the purchase of monographs, asked their administrations for special budget increases, and when these were not enough, canceled millions of dollars worth of serials. Libraries also turned to document delivery services and developed strategies to improve interlibrary lending performance. They sought to re-invigorate cooperative collection development programs. More recently, site licensing of electronic resources helps eliminate the need for duplicate print subscriptions while consortial arrangements are reducing unit costs at individual institutions while spreading costs across a wider range of libraries. While all of these strategies can help local institutions better manage their budgets, none of them have changed the underlying dynamics of a system where the publisher, operating in a monopolistic environment, can unilaterally set prices without a countervailing pressure from competitive forces.

### **Calls for Competition**

In 1988, at the request of ARL, the Economic Consulting Services Inc. (ECS) undertook a study of trends in average subscription prices and publisher costs from 1973-1987. The study compared the price per page over time of a statistically valid sample of approximately 160 journal titles published by four major commercial publishers (Elsevier, Pergamon, Plenum, and Springer-Verlag) with an estimated index of publishing costs over the same time period. The study concluded that the price-per-page of the journals exceeded the growth in costs by 2.6 to 6.7% a year. This could mean that these companies were enjoying operating profits of 33 to 120% a year. The ECS concluded that "If such estimated rates of growth are reasonably accurate, then the library community would benefit greatly from such measures as the encouragement of new entrants into the business of serials publishing, and the introduction of a program to stimulate greater competition among publishers by injecting a routine of competitive bidding for publishing contracts of titles whose ownership is not controlled by the publishers."<sup>14</sup>

In a companion piece to the ECS study, a contract report by Ann Okerson defined the causes of the "serials crisis" and proposed a set of actions to confront

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<sup>13</sup> Carol Tenopir and Donald King, *Towards Electronic Journals: Realities for Scientists, Librarians and Publishers* (Washington, D.C.: Special Libraries Association, 2000), p. 303.

<sup>14</sup> Economic Consulting Services Inc., "A Study of Trends in Average Prices and Costs of Certain Serials Over Time" in *Report of the ARL Serials Prices Project* (Washington, DC: Association of Research Libraries, May 1989), p. 21.

the problems. The report concluded that “the distribution of a substantial portion of academic research results through commercial publishers at prices several times those charged by the not-for-profit sector is at the heart of the serials crisis.”<sup>15</sup> The report went on to note that:

Satisfactory, affordable channels for traditional serials publication already exist. For example, there are reasonably priced commercial serials publishers. Many of the non-profit learned societies are already substantial publishers. University presses could substantially expand their role in serials publishing. . . The serials currently produced by these organizations are significantly less expensive than those from the commercial publishers, even though they may increase in price at similar rates. Several analyses of the “impact” of serials, in terms of the readership achieved per dollar, show that those produced by non-commercial sources have a higher impact than commercial titles.<sup>16</sup>

Among the recommendations in the report was one centered on introducing competition: “ARL should strongly advocate the transfer of publication of research results from serials produced by commercial publishers to existing non-commercial channels. ARL should specifically encourage the creation of innovative non-profit alternatives to traditional commercial publishers.”<sup>17</sup>

Over the next several years, ARL directed great energy at engaging stakeholders beyond the library community, such as societies, university presses, and university administrators, in the discussions of the scholarly communication crisis. The Association of American Universities (AAU) formed a series of task forces to address key issues related to research libraries. The Task Force on a National Strategy for Managing Scientific and Technological Information took up, as its name suggests, the issues related to scholarly journals publishing. In its report of May 1994, the Task Force called for competition, but this time competition facilitated through electronic publishing. The recommendation stated that the community should “Introduce more competition and cost-based pricing into the marketplace for STI by encouraging a mix of commercial and not-for-profit organizations to engage in electronic publication of the results of scientific research.”<sup>18</sup>

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<sup>15</sup> Okerson, p. 43.

<sup>16</sup> Ibid.

<sup>17</sup> Ibid., p. 42.

<sup>18</sup> “A National Strategy for Managing Scientific and Technological Information,” in *Reports of the AAU Task Forces* (Washington, D.C.: Association of Research Libraries, 1994), p. 55.

Over the next several years, ARL developed several proposed projects intended to address the crisis in scholarly publishing. These were rejected as too narrow or too broad or not directed at the appropriate leverage point in the system. Reaching consensus among the membership on a way forward seemed less and less likely. In the meantime, prices continued to climb. Finally, in May of 1997, at an ARL membership meeting, Ken Frazier, Director of Libraries at the University of Wisconsin, Madison, proposed that "If 100 institutions would put up \$10,000 each to fund 10 start-up electronic journals that would compete head to head with the most expensive scientific and technical journals to which we subscribe, we would have \$1 million annually. . . . I don't see any way around the reality that we have to put the money out in order to make this start to happen."

Within six months, Frazier's proposal had a name--SPARC, the Scholarly Publishing and Academic Resources Coalition, a business plan was in development, and potential partnerships were under discussion. In June 1998, a SPARC Enterprise Director was hired (Richard Johnson) and the first partnership (with the American Chemical Society) was announced.<sup>19</sup>

## **SPARC**

SPARC's overall mission is to restore a competitive balance to the STM journals publishing market by encouraging publishing partners (for example, societies, academic institutions, small private companies) to launch new titles that directly compete with the highest-priced STM journals or that offer new models that better serve authors, users and buyers. In return, libraries agree to purchase those titles that fall within their collections parameters. By leveraging their subscription dollars, libraries reduce the financial risk for publisher-partners allowing them the time to build the prestige needed to attract both authors and readers.

SPARC is a membership-based organization of over 200 libraries and library organizations in Hong Kong, Australia, Belgium, Denmark, Germany, England, Canada, and the United States. Members pay a modest annual membership fee and agree to the purchase commitment.

A number of strategies must be pursued for SPARC to be successful. First, it must be able to deliver on library subscriptions to partners. This includes marketing support that reaches both SPARC members and the broader library community. SPARC is also working with prestigious societies and editorial

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<sup>19</sup> For a description of the development of SPARC, see Sarah C. Michalak, "The Evolution of SPARC," *Serials Review* 26, no. 1 (2000):10-21.

boards. This is essential to build name recognition for SPARC and early interest in new titles. Raising faculty awareness of the issues in scholarly publishing is also a critical component of the SPARC program. Faculty who understand the context are more likely to change their submissions habits if there is a reasonably priced prestigious or promisingly prestigious alternative. This educational effort is also intended to encourage editors to become more engaged in the business aspects of the titles for which they work. Editors (or societies) can renegotiate contracts, move their titles, or start up competitors. SPARC must also catalyze the development of capacity and scale within the not-for-profit sector. STM publishing is clearly dominated by commercial companies. (A recent market analysis by Outsell, Inc., estimates that commercial companies account for 68% of the worldwide revenue for STM primary and secondary publishers.<sup>20</sup>) For a true competitive environment to exist, much greater capacity in the non-profit sector is essential.

As it has developed over the past two years, SPARC has categorized its efforts into three programmatic areas: SPARC Alternatives, SPARC Leading Edge, and SPARC Scientific Communities. The first and most directly competitive of these is the SPARC Alternatives program.

#### *SPARC Alternatives*

SPARC Alternatives are the titles that compete directly with high-priced STM journals. The first partnership in this category was that with the American Chemical Society (ACS) which agreed to introduce three new competitive titles over three years. *Organic Letters*, the first of these, began publication in July 1999. *Organic Letters* is intended to compete with *Tetrahedron Letters*, an \$8859 title (2000 subscription price) published by Elsevier Science. ACS, one of the largest professional societies in the world and highly respected for its quality publications program, was able to attract three Nobel laureates and 21 members of the National Academy of Sciences to its new editorial board. Two hundred and fifty articles were posted on the *Organic Letters* website and more than 500 manuscripts were submitted in its first 100 days.<sup>21</sup>

A subscription to *Organic Letters* currently costs \$2,300 for a print subscription. The business plan calls for a fully competitive journal offering 65-70% of the content at 25% of the price. The effects of this new offering have already been felt. The average price increase for *Tetrahedron Letters* for several years had been 14%. For 2000, just after *Organic Letters* was introduced, the price increase of

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<sup>20</sup> "Industry Trends, Size and Players in the Scientific, Technical & Medical (STM) Market," *Information About Information* 3, no. 18 (August 22, 2000): p. 6.

<sup>21</sup> Data provided by the American Chemical Society to SPARC, January 2000.

*Tetrahedron Letters* was only 3%. For that year, the average price increase across all of the Elsevier Science titles was 7.5%. Even more importantly, the introduction of *Organic Letters* had a significant impact on the number of pages and articles published by *Tetrahedron Letters*.<sup>22</sup> During the second half of 1999, the number of articles in *Tetrahedron Letters* declined by 21% compared to the same period in 1998 and the number of pages declined by 12%. In the first half of 2000, the number of articles decreased 16% compared to the first half of 1999 while the number of pages actually increased 5%. The loss in articles has been compensated for by increasing the number of pages per article, in the second half of 1999 by 11% and the first half of 2000 by 24%. *Organic Letters*, in the meantime, surpassed its projected pages and articles and has clearly demonstrated that quality, low-cost alternatives can attract \_\_\_\_wΣs. The second ACS SPARC Alternative, *Crystal Growth and Design*, will be introduced in 2001.

Another high profile SPARC Alternative is *Evolutionary Ecology Research (EER)*, a title founded by Michael Rosenzweig, a Professor of Ecology and Evolutionary Biology at the University of Arizona. In the mid-1980's, Rosenzweig founded and edited *Evolutionary Ecology* with Chapman & Hall. The title was subsequently bought and sold, most recently in 1998 to Wolters Kluwer. During these years, the journal's price increased by an average of 19% a year. Fed up by the price increases and the refusal of the publishers to take their concerns seriously, the entire editorial board resigned. In January 1999, they launched their own independent journal published by a new corporation created by Rosenzweig. A subscription to *EER* was priced at \$305, a fraction of the cost of the original title (\$800).<sup>23</sup>

Thus far in its first two years, *EER* has published 13 issues while the original title has published only 4. Authors had no qualms submitting their papers to this new journal edited by respected scholars in the field. In fact, 90% of the authors withdrew their papers from *Evolutionary Ecology* when the editorial board resigned. *EER* was quickly picked up by the major indexes, surmounting yet another hurdle that faces new publications. And, most significantly, *EER* broke even in its first year. SPARC played a significant role in generating publicity about and, more importantly, subscriptions to *EER*. *EER* is another example of how a new title can quickly become a true competitor.

SPARC has a number of other titles in the Alternatives program. These include *PhysChemComm*, an electronic-only physical chemistry letters journal published by the Royal Society of Chemistry; *Geometry & Topology*, a title that is free of

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<sup>22</sup> The following analysis is based on data collected by SPARC, July 2000.

<sup>23</sup> An account of the development of *Evolutionary Ecology Research* can be found in Michael L. Rosenzweig, "Protecting Access to Scholarship: We are the Solution" [<http://www.evolutionary-ecology.com/citizen/spring00speech.pdf>]

charge on the web with print archival versions available for a fee; the *IEEE Sensors Journal*, to be published by the Institute for Electrical and Electronics Engineers in 2001; and *Theory & Practice of Logic Programming*, a journal founded by an entire editorial board who resigned from another title after unsuccessful negotiations with the publisher about library subscription prices. A number of other partnerships are under negotiation.

#### *SPARC Leading Edge Partnerships*

To support the development of new models in scholarly publishing, SPARC has created a “Leading Edge” program to publicize the efforts of discipline-based communities that use technology to obtain competitive advantage or introduce innovative business models. Two titles in this program are the *New Journal of Physics* and the *Internet Journal of Chemistry*.

The *New Journal of Physics*, jointly sponsored by the Institute of Physics (U.K.) and the German Physical Society, is experimenting with making articles available for free on the web and financing production through the charging of fees to authors whose articles are accepted for publication. That fee is currently \$500.

The *Internet Journal of Chemistry* is experimenting with attracting authors by offering them the opportunity to exploit the power of the Internet. This electronic only journal was created by an independent group of chemists in the U.S., the U.K., and Germany. It offers the ability to include full 3-D structures of molecules, color images, movies and animation, and large data sets. It also allows readers to manipulate spectra. Institutional subscriptions to the journal cost \$289.

#### *SPARC Scientific Communities*

Another important program area for SPARC is the Scientific Communities. These projects are intended to support broad-scale aggregations of scientific content around the needs of specific disciplinary communities. Through these projects, SPARC encourages collaboration among scientists, their societies, and academic institutions. The Scientific Communities program helps to build capacity within the not-for-profit sector by encouraging academic institutions to develop electronic publishing skills and infrastructure, and seeks to reduce the sale of journal titles by providing small societies and independent journals alternative academic partners for moving into the electronic environment.

One of the most ambitious projects in the Scientific Communities is *BioOne* [[www.BioOne.org](http://www.BioOne.org)], a non-profit, web-based aggregation of peer-reviewed articles from dozens of leading journals in adjacent areas of biological,

environmental, and ecological sciences. Most of these journals are available currently only in print. While there is a risk to societies of offering electronic versions of their titles, i.e., the loss of personal member subscriptions, there is a greater danger that scholarship not in electronic form will be overlooked and marginalized. But many of the societies do not have the resources or expertise to create web editions on their own. *BioOne* provides that opportunity.

*BioOne*, to be launched in early 2001 with 40 titles out of an eventual 200, is a partnership among SPARC, the American Institute of Biological Sciences, the University of Kansas, the Big 12 Plus Library Consortium, and Allen Press. In an unprecedented commitment to ensuring that the societies not only survive but play an expanding role in a more competitive and cost-effective marketplace, SPARC and Big 12 Plus Library Consortium members have contributed significant funds to the development of *BioOne*. These funds will be returned over a five year period as credits against their subscriptions. *BioOne* offers participating societies a share in the revenues, protection against accelerated erosion of print subscriptions, and no start-up or continuing costs for text conversion and coding.

Several other Scientific Communities projects have received support from SPARC. These include *eScholarship* from the California Digital Library, Columbia *Earthscape*, and MIT *CogNet*. The goal of California's *eScholarship* project [escholarship.cdlib.org] is to create an infrastructure for the management of digitally-based scholarly information. *eScholarship* will include archives of e-prints, tools that support submission, peer-review, discovery and access, and use of scholarship, and a commitment to preservation and archiving. Columbia's *Earthscape* [www.earthscape.org] is a collaboration among Columbia University's press, libraries, and academic computing services. The project integrates earth sciences research, teaching, and public policy resources. The Geological Society of America is currently exploring a collaboration with Columbia to add a new aggregation of major geoscience journals to the site. MIT *CogNet* [cognet.mit.edu] is an electronic community for researchers in cognitive and brain sciences. A collaboration between the MIT Press and the MIT Libraries, *CogNet* includes a searchable, full-text library of major reference works, monographs, journals, and conference proceedings, virtual poster sessions, job postings, and threaded discussion groups. All three of these projects received funding from SPARC in a competitive awards process.

## **Measuring Success**

When SPARC was being designed, the developers set out a number of measures by which its success could be determined. These included:

- SPARC supported projects are financially viable and significantly less expensive;
- SPARC supported products are attracting quality authors and editors;
- New players have entered the STM marketplace;
- An environment where editorial boards have been emboldened to take action has been created; and
- STM journal price increases have moderated significantly.

It was anticipated that it may take as much as five years to begin to see the effects of SPARC.

At this point, SPARC has been in existence for only three years. But there are already signs that it is having the desired impact. *Evolutionary Ecology Research* is financially viable and is offering quality content for under 40% of the alternative. *Organic Letters* is on track to meet its financial goals and has been able to attract high quality editors and editorial board members. In addition, it has quickly attracted authors away from its competitor, as has *EER*.

Through the Scientific Communities program, SPARC is supporting new players in the market – partnerships have included libraries, library consortia, and academic computing centers working with societies, university presses, independent journal boards, and individual faculty. These projects are very early in their development but give a clear indication of the long term possibilities for expanding not-for-profit publishing capacity.

SPARC has also been very successful to date in generating publicity. This in turn has created an environment where editorial boards and societies are beginning to question their publishers about pricing and other policies. Some of these negotiations are successful leading to the lowering of prices as happened recently in the case of *American Journal of Physical Anthropology*. The American Association of Physical Anthropologists was concerned over the many cancellations of its journal that had resulted from high prices. The Association and the Editorial Board informed the publisher of its title that they were considering options, including the possible launch of a competitive journal. After extensive negotiations, the publisher and the Association were able to come to terms, which resulted in a reduction in the subscription price of more than 40%.<sup>24</sup>

Other negotiations between editorial boards and commercial publishers have not been as successful. In the case of the *Journal of Logic Programming*, the entire

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<sup>24</sup> "AAPA Negotiates Wiley Journal Price Cut!," *Library Journal Academic Newswire*, September 12, 2000.

editorial board resigned after 16 months of unsuccessful negotiations about the price of library subscriptions. They have founded a new journal, *Theory and Practice of Logic Programming*, which will begin publication in January 2001.<sup>25</sup>

The ultimate aim of SPARC is to make scientific research more accessible by lowering prices for STM journals across the board. In 2000, the overall average increase in STM journal subscriptions fell below 9% for the first time since 1993.<sup>26</sup> Elsevier Science announced in 1999 that it was ending the days of double-digit price increases and set increases for 2000 at 7.5% and 2001 at 6.5%.<sup>27</sup> These changes are significant.

While SPARC may not be the only cause of these changes, it does seem clear that by raising the profile of the issues and achieving some early 'proof of concept' success, SPARC has emboldened librarians, scholars, and societies to take action. Competition can work.

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<sup>25</sup> Joan S. Birman, "Scientific Publishing: A Mathematician's Viewpoint," *Notices of the AMS* 47, no. 7 (July 2000): 772-73.

<sup>26</sup> Albee and Dingley, p. 80.

<sup>27</sup> Elsevier Science Ad, *Science* 289 (August 11, 2000):890.