# Exchange rate profiteering and cost-effectiveness of physics journals - 2006 Update

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In this, my third report to the Physics Roundtable(1) on serials pricing, I would first like to pay tribute to Tom McIlrath, who is retiring, in September, as the APS treasurer. Fortunately, he will be succeeded by another physicist, Joseph Serene, who is currently both a professor at Georgetown University and Secretary-Treasurer of the APS Division of Condensed Matter Physics.

I first met Tom, several years ago, when he and Barbara were doing a road show explaining why the APS needed to raise subscription rates slightly, transition to a multi-tiered journal pricing model, and to eliminate author page charges. Tom really deserves a special place in our hearts for honestly opening up the books during that process and giving librarians and administrators a benchmark for the cost of publishing sci-tech journals.

What is astounding to me is that the subscription price for PR-ALL actually decreased slightly for 2005, despite an increase in both articles and pagination of more that 11%. For 2006, the beat goes on and, despite a projected increase of 6% in both articles and pagination for 2006, the subscription price increased only 3%. This has resulted from the APS' willingness to share, with its subscribers, some of the cost savings that resulted from automation and is clearly deserving of an special award.

Now to the business at hand …

Looking back at my 2004 presentation, I mentioned the possibility of exchange rate profiteering by commercial European publishers and gave some examples of apparent surcharges. Well, as you

might NOT suspect from reading about the dramatic decrease in the value of the US$ vs the EURO, there has been a partially beneficial result for Elsevier's US$ subscribers. Unfortunately, this is not the case with both Springer and Wiley-VCH.

Elsevier, as you may remember, beginning with year 2000 subscriptions, changed to a US$ pricing policy completely independent of foreign currency exchange rates, for subscriptions outside of Europe and Japan. This policy change, which precludes subscribers outside of Europe from ordering Elsevier subscriptions thru European agents and paying with EUROs, was based on the premise that "moderated and more predictable level of price increases", and a less than 10% per year increase, were preferable to subscription rates subject to exchange rate fluctuations each year.

Elsevier followed thru on their promise of a less than a 10% per year increase based on their 1999 US$ subscription prices, which were based on exchange rates. Springer and Wiley-VCH, also both transitioned to a restrictive US$ pricing policy beginning in 2000.

Table 1 provides the apparent surcharge data for Nuclear Physics, European Physical Journal-B and Physica Status Solidi-B. The apparent surcharge is the difference between the actual US$ cost of these journals to US Libraries compared with the US$ cost based on the pre-2000 pricing policy.

The restrictive US$ subscription policy initially appeared to be very beneficial to Elsevier, Springer and Wiley-VCH, because of the decreased US$ cost of EUROs between 1999 and 2002. The subsequent increase in the US$ cost of the EURO since 2002, however, has greatly reduced the apparent surcharge. Elsevier, to their credit, set a comparatively more reasonable US$ price for their year 2000 subscriptions and as a consequence their apparent surcharge decreased more quickly than Springer or Wiley-VCH.

This unfortunate situation regarding possible exchange rate profiteering is, however, only part of the subscription pricing problem. I next want to address concerns about value and quality.

Henry Barschall (2a) introduced the concept of cost-effectiveness, which provides a measure that combines value and quality. Barschall's method has been refined (2b) to produce a different [cost/article] value measure, and its corresponding [cost/article/ISI Impact Factor] cost-effectiveness measure. Table 2 shows that Physical Review-B (APS) has a 2004 cost/article of $1.33 and a cost-effectiveness of 0.43, with commercial journals ranging from $7.30 to $28.42/article and have cost-effectiveness measures from 4.42 to 8.99.

One way to look at the cost-effectiveness measure is to compare it with the unit pricing seen on grocery store shelves. If this analysis is valid, Physical Review-B is clearly between 10 and 20 times more cost-effective than its commercial counterparts; or, in terms of the grocery store analogy, Physical Review-B has a cost-effectiveness of 43 cents/unit compared to $4.42 to almost $9/unit for its commercial counterparts.

Another interesting metric is Market Influence, which is the product of the number of articles published in a given year multiplied by the journal's ISI Impact Factor (3) for that year. It gives another measure of cost-effectiveness. Table 3 gives the Market Influence data for Physical Review-B and its commercial counterparts. Physical Review-B with a Market Influence of over 15K, a subscription cost of less than $7K and a cost/MI of $0.43 stands in stark contrast to the combined data for the other 5 titles which have a total Market Influence of little over 4K, a total subscription cost of nearly $27K, and a cost/MI of over $6.

One might suggest that this enormous disparity in both value and cost-effectiveness is due to economies of scale, since Physical Review-B is publishing more than half again as many articles as

the combined total of these counterparts. If this is the case, doesn't it stand to reason that commercial publishers need to quickly begin combining what amount to 'boutique' journals into a publication that can compete with the value and cost-effectiveness of Physical Review? This is especially important since there are strong indications that the US government will continue to allow the US$ to decrease in value vs the EURO.

Because of the exploding increase in submissions, it should be obvious that high-value/high-quality journals published by all the learned societies will require steady increases in subscription prices for the foreseeable future. In this regard, it is essential for libraries to follow Ken Frazier's advice (4) and avoid or exit multi-year, non-cancellable commitments to commercial publishers' packages. Following his advice will allow libraries faced with budget stasis or reductions to ensure uninterrupted subscriptions to learned society journals, which are the essential core of a library's journal collection.

1a. Roth, Dana L. "Exchange rate profiteering and cost-effectiveness of physics journals." 2003 http://resolver.caltech.edu/CaltechLIB:2003.006

1b. Roth, Dana L. "Exchange rate profiteering and cost-effectiveness of physics journals - 2004 Update". http://resolver.caltech.edu/CaltechLIB:2004.002

2a. H.H. Barschall,"The Cost-Effectiveness of Physics Journals," Physics Today 41(7):56-59, July 1988. http://barschall.stanford.edu/articles/pt8807.pdf (accessed 5/3/06)

2b. D.L. Roth," Cost/page and cost/page/impact factor data for selected mathematics journals. http://resolver.caltech.edu/CaltechLIB:dzrCPA05 (accessed 5/3/06)

3. The ISI Impact Factor.

http://scientific.thomson.com/free/essays/journalcitationreports/impactfactor

(accessed 5/3/06)

4. K. Frazier, The Librarians' Dilemma: Contemplating the Costs of the "Big Deal". D-Lib Magazine, 2001, 7(3). http://www.dlib.org//dlib/march01/frazier/03frazier.html

Accessed 5/8/06.

Table 1. Apparent Surcharge Data 2003-2006

| | 2003 | 2004 | 2005 | 2006 |
|---|---|---|---|---|
| Nucl. Phys. | $4,699 | $1,595 | -$1,719 | -$3,758 |
| | 24.7% | 6.3% | -6.6% | -13.8% |
| Eur. Phys. J-B | $1330 | $842 | $406 | $108 |
| | 30.8% | 18.2% | 8.1% | 2.1% |
| Phy.Stat.Sol.-B | $1153 | $871 | $340 | $154 |
| | 37.9% | 21.5% | 6.8% | 2.6% |

Table 2. 2004 Cost/article, ISI Impact Factor and Cost-effectiveness data.

| | Cost/article | ISI IF | C/a/IF |
|---|---|---|---|
| Phys. Rev.-B | $1.33 | 3.08 | 0.43 |
| Thin Solid Films | $7.30 | 1.65 | 4.42 |
| Eur. Phys. J. - B | $11.42 | 1.43 | 7.99 |
| J. Mech. Phys. Solids | $28.42 | 3.44 | 8.26 |
| Phys. Status Solidi-B | $8.64 | 0.98 | 8.82 |
| Mat. Sci. Eng.-B | $8.27 | 0.92 | 8.99 |

Table 3. 2004 Market Influence data.

| | Articles | ISI IF | MI | cost/MI |
|---|---|---|---|---|
| Phys. Rev.-B | 4964 | 3.1 | 15388 | $0.43 |
| Thin Solid Films | 1403 | 1.65 | 2315 | $4.42 |
| Eur. Phys. J. - B | 398 | 1.4 | 557 | $8.29 |
| J. Mech. Phys. Sol. | 112 | 3.4 | 381 | $8.35 |
| Mat. Sci. Eng.-B | 466 | 0.92 | 429 | $8.99 |
| Phys. Status Sol.-B | 557 | 0.98 | 546 | $9.00 |
| Total | 2936 | | 4228 | $6.34 |