

Learned Publishing (2006), 19, 15–30

Introduction

During the past 18–24 months there has been much debate about the sustainability of an open access (producer-pays) business model for scholarly journals, with particular interest from the learned societies whose mission and purpose is aligned with the overarching goals of such a model. However, in the absence of factual data on publisher economics and the impact of trends that are affecting journal publishing performance, it is not possible for learned society publishers or their boards to make well-informed decisions about the appropriate strategy with respect to open access (OA) for their journal(s). The purpose of this study was to contribute to the knowledge and understanding that exists by providing case-studies of a sample of typical learned society publishers, by identifying trends through analysis of three years of precise data provided by the publishers for 2002, 2003, and 2004, noting landmarks and proposing best practice guidelines for publishers wishing to move to an OA model. The results of the study, which are provided in full in the Joint Information System Committee (JISC) report,¹ give a practical fact-based framework which the publishing leadership in learned societies can use to support and inform active engagement with the key and core business issues surrounding a move to an OA business model, and the steps involved in doing so.

Methodology and overview of the publishers in the study

Nine learned society publishers agreed to take part in this study by responding to an invitation posted on two key list-servs as follows:

JISC wishes to elucidate in detail if and how learned society publishers can consider making a transition to a sustainable

Learned society business models and open access: overview of a recent JISC-funded study

Mary Waltham

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ABSTRACT: *A summary of the findings of a study which included an in-depth exploration of journal business and pricing models of nine learned societies in the context of their requirements and of the open access (OA) business model. Detailed information on current trends in revenue costs and surplus is included. The article considers whether and how OA can be adopted by the representative sample of STM publishers.*



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open access business model, and what the funding sources and requirements would need to be in order to do so. JISC is seeking UK-based societies to participate in a Business Model study by providing information which will be used in complete confidence to develop a number of case studies.

In subsequent communication all of the publishers were assured that:

All of the information you provide will be held in complete confidence and not divulged to JISC. The publishers involved in this study will not be identified publicly and care will be taken to ensure that the identity of the journals on which the cases are based cannot be deduced.

Eight of the publishers analysed in the study were based in the UK. One learned society publisher from the USA was invited to take part in the study to help provide further context to the particular issues facing the UK publishers. In total these nine publishers provided detailed circulation and profit and loss information about 13 journals. One journal is fully OA (producer pays) and so no circulation figures could be provided, and two publishers of the nine were unable to provide the complete three years of profit and loss data as requested.

All of the publishers can be described as not-for-profit and all use the surplus generated by publishing to support other activities central to their mission as a learned society.

The nine publishers account for the circulation, revenue, and costs of their journals in quite different formats. In order to compare the overall changes taking place over the past three complete fiscal years it was essential to establish a common approach and so publishers were asked to supply information about one or more of their journals within two templates:

- Authors and Readers (Appendix 1 of report).
- Profit and Loss (Appendix 1 of report).

In addition, face-to-face interviews were conducted with each of the publishers during April and May 2005 and the responses to

those interviews in combination with the completed templates were used to develop a case study for each publisher, which is included within the full report. Interviews also provided an opportunity to talk through and clarify the information provided by the publisher.

The nine study participants are active in the following areas of STM publishing:

- Clinical medicine: two publishers
- Biomedicine: one publisher
- Applied biology: two publishers
- Science: one publisher
- Technology: two publishers

Plus one publisher active in both the life and physical sciences.

The sample of journals

The journals included in the study were selected in collaboration with the publishers based on a participants' brief discussed with them in some depth before they decided to take part. Although the sample size was small and each journal quite individual, the results show overall trends that are consistent within STM publishing. Where there are wide divergences these are noted for the reader.

Frequency	No. of journals
24 per year	1
12 per year	9
6 per year	2

The content published varied as would be expected across traditional STM areas with some journals including extensive mathematical setting, numerous graphs and charts, and very little colour, and others frequently including numerous illustrations such as half-tone photomicrographs or four-colour histopathology figures.

Length of article also varied by broad discipline and within the 'Information for Authors' for each journal, maximum and optimal article lengths are provided by the publishers.

One of the journals is already fully OA, and one has been experimenting with a

all of the publishers can be described as not-for-profit

hybrid OA model where if authors wish to pay a fee their article is OA from the date of publication. Several of the other participants are interested in experimenting, although justified nervousness about the impact of such an experiment on overall business performance is likely to lead to more cautious experimentation with small and less critical journals.

Four of the 13 journals publish considerable numbers of pages of specially commissioned review and commentary about current research topics. The remaining nine journals are more typically 'learned journals' in content and presentation with little or no context or interpretation of the research provided explicitly for readers.

*alternative
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publishing
peer-reviewed
research are
likely to be
required*

Key questions posed

Each publisher represented a case study that fed into the analysis and recommendations generated by the study. Information requested included financial, pricing, submissions, and circulation data in order to answer the following questions:

- Where do the revenues come from at present?
- What are the costs?
- Where is the surplus generated?
- What are the existing business and pricing models?
- How and can publishers move to an OA business model?
- What level of OA would each publisher in the sample need to charge in order to move to this business model and maintain the same or a similar level of surplus?
- What are the early results of publishers' OA experiments revealing?
- Is the society dependent on its journals programme for funding of other activities?
- Does this affect the ability to move to the OA model? How?
- Are the funding agencies for the research published by the journal(s) willing to support the OA model?
- Is the OA model sustainable?

Why change the business model?

The annual world production of research results as peer-reviewed published articles is

increasing from an estimated 1.2 million articles in 2003. This increase is driven by growth in global research funding and in certain disciplines the tendency to produce many more articles to describe one substantive research finding (the least publishable unit [LPU] problem). Individual journal pricing and annual price increases have been driven by a number of economic factors including the increasing numbers of articles and pages published. The selection and production of more edited content drives up the cost of both print and online versions of scholarly journals.

As the volume of the research literature grows, higher education is not in a position to provide all the injection of funds required to pay for increased print and online publishing costs. For example, many US state institutions have been faced with library acquisition budgets that are flat or falling. The investigation of alternative models and alternative ways of handling research reports has been supported by higher education institutions generally.

For each of these reasons alternative models for publishing peer-reviewed research are likely to be required because existing business models for the scholarly communications system which rely solely or most heavily on subscription fees paid by institutions may become unsustainable.

Open access as a business model?

Open access² business models have been widely promoted within the scholarly publishing community as the basis for transforming and resolving the funding problems of the communication of research. However, precise data on revenues and costs of publishing peer-reviewed journals in print and online have been difficult to access.

Estimates of the cost per article for publication vary widely, with sketchy or incomplete data to support figures proposed and poor definition of which elements of the publishing process are to be covered by OA author fees, for example. The average cost to publish an article will depend on a number of factors that have not been addressed in much of the literature on the topic. These include the overall rejection rate – the

Table 1 Member subscriptions by country (12 journals)

Country of publisher	End 2002	End 2004	Change	% Change
US (2 journals)	14,250	13,616	−634	−4.4
UK (10 journals)	3,602	3,673	+71	+2
Total	17,852	17,289	−563	−3

higher the rate the higher the cost per published article – and length of article – long articles cost more to publish than short articles since the costs of creating journal content are driven by the volume of content processed. The number and complexity of figures and illustrations and the amount of colour also affect cost; the more of any of these, the more costly the article is to publish.

Circulation trends

Circulation data for the three year period 2002–2004 provided by the nine participating publishers illustrate a number of trends and principles. Print subscription numbers fell by 43%. Online-only subscriptions also fell by 6%; however, the notion of a single online subscription is artificial given that many of the publishers are selling site-wide licenses for their online journals. Site license numbers certainly grew through the period, but most of these learned society publishers have limited sales and marketing resources of their own and so site license sales are handled by a third party. Therefore the exact numbers of site licensees were often not provided by the publisher as they may see these incorporated within the total online subscription number reports provided or simply have the names of consortia, each of which can comprise many institutions served with a journals collection.

Member subscriptions account for almost two-thirds of all subscriptions in terms of numbers for the publishers. However, there is a sharp difference between the UK and US publishers with respect to policies on member subscriptions. Of the 17,289 member subscribers to all the journals in 2004, 13,616 (78% of the total member subs) are to the two US journals. Members of the US society received an online subscription as

part of their membership throughout the period with no additional payment due; in addition a print subscription is available at a very low member price. In the UK all but one society publisher requires an additional separate payment for a member to receive a journal subscription whether it is print or online, and this clearly affects total member subscription numbers. See Table 1.

In 2004, members accounted for 2% of the total subscription revenue received but were 63% of the total number of subscriptions fulfilled. Member print subscriptions are often fulfilled below cost. Several of the UK publishers have recently started to offer online-only subscriptions to members – often at a substantial discount – as part of their strategy to convert members to online-only access.

Member print copies fell by just 382 or 18% over the three years, while online-only subscriptions offered by just three publishers remained fairly flat down by just 137 (−1%). Combined print and online subscriptions for members grew by 375 (+22%) with losses in this category by the US publisher being more than offset by gains from the UK publishers. See Figure 1.

Institutions

Institutional subscriptions represent one-third of all the subscriptions sold to the 12 journals whose business model includes subscription-controlled access. Institutional subscription revenues provided 97% of total subscription revenues in 2004. The pattern of change for all the institutional subscriptions to the 12 journals is shown in Figure 2.

All versions of institutional subscriptions fell within the steep overall drop of 22%. The steepest fall was in institutional print subscriptions, which fell by 2,572 (56%).

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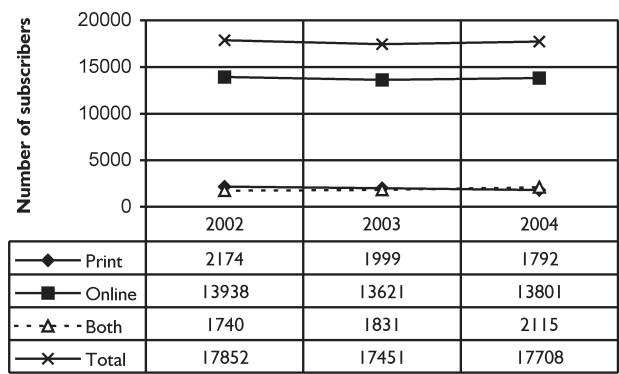


Figure 1 Total member subscriptions by version, 2002–2004 (12 journals).

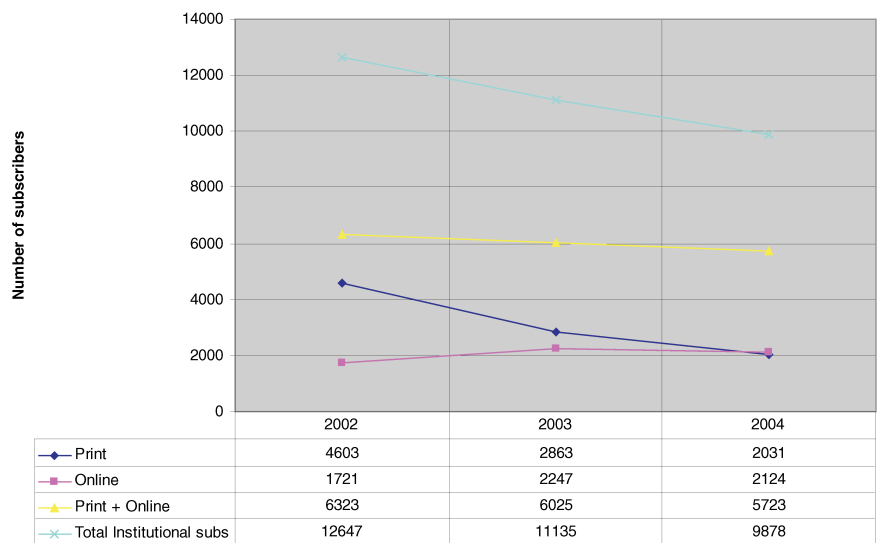


Figure 2 Total institutional subscriptions by version, 2002–2004 (12 journals).

not all the publishers are offering site licenses

Four of the publishers were offering online-only subscriptions and these increased by 403 (23%) in the three years. Although all of these publishers are experiencing a downward trend in their overall institutional subscription numbers, for a sub-set this was especially marked, notably in the life sciences. In contrast, one technology society publisher has been developing its international sales to institutions and recorded a 7% growth in institutional subscription numbers over the three years.

Of course it is impossible to consider individual subscription counts by institu-

tion as a measure of access when most of the publishers offer site-wide access to the online version. Adding in the number of site licenses sold would show an increase in the numbers of institutions this group of publishers are reaching. Not all the publishers are offering site licenses and several were not sure to what extent individual institutional subscription sales are being cannibalized by sublicensed third-party aggregator sales of online access to individual institutions and to consortia.

My impression is that the subscription pricing models for this sample of publishers

Table 2 Institutional subscriptions by country

Country of publisher	End 2002	End 2004	Change	% Change
US (2 journals)	1,108	1,029	-79	-7
UK (10 journals)	12,330	8,251	-4,079	-33
Total	13,438	9,280	-4,158	-31

often did not reflect the added value and usage of an online site license because many priced a license at the same price as a single online institutional subscription and this price was in turn always based on the single institutional print subscription price.

Table 2 compares changes in institutional subscriber numbers for the 10 UK-based journals with the two US-based journals where overall the loss has been less steep.

Subscription revenue

Society member subscriptions fell by 3% but revenue was up by 6%. Institutional subscriptions, which account for one-third of all subscribers, fell by 22% but revenue was up by 9%. Revenue from non-member individual or personal subscriptions, which account for 2% of subscribers, fell dramatically by 70% over the period 2002–2004.

Subscription revenue accounts for ~88% of total revenue for the 10 journals for which the full three years of information was available over the period 2002–2004 and this proportion is even higher if the two US journals with author page charges are removed. Some 32% of the total revenue for the two US journals combined comes from author payments, which is fairly typical of a US society journal. Institutional subscription revenue accounts for ~97% of total subscription revenue to the 10 journals reviewed 2002–2004, and ~86% of the total journal revenues. There is heavy reliance on institutional subscriptions, which for all but one journal fell in number through this period.

Average revenue per article from all sources for all 13 journals in 2004 was £1,918 and per page was £194.

Article submissions and pages published

Article submissions to the journals combined increased by 35% and the number of

articles published by 25%. Total pages published for the 10 journals where three consecutive years of complete data were available increased by 33% from 2002 to 2004. These increases mirror overall growth in published research output. Increases in the number of pages published in the journals are in turn driving up costs.

Costs

The average cost per article for print and online publication for all 13 journals in 2004 was £1,447 and per page was £144, but this average covers a broad range including one journal that is online only. The life sciences journals included in the study were publishing more and shorter articles than the physical sciences and technology journals, and these broad differences have a significant impact on the ‘cost per article’ which will vary by discipline, by journal type, and by editorial policy.

Publishing costs can be divided into two component categories: *fixed* costs that are incurred regardless of the number of subscribers, and *variable* costs that are associated with each subscription.

Fixed costs involve both content creation and publishing support activities:

- *Content creation* costs are all the costs associated with preparing the editorial content for publication. It includes the editorial office costs of salaries and space and reviewing, editing, SGML/HTML/XML coding and composition of both articles and non-article content such as letters to the editor, book reviews and advertising, all in preparation for print and online distribution.
- *Publishing support* activities are journal costs such as marketing, advertising sales, finance, and administration, including

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management costs and the office costs of these activities.

Variable costs include:

- **Manufacturing:** paper, printing, and binding. *Production* of the online version including repackaging of content.
- **Distribution:** costs of the physical publication or as an online product, and order fulfilment including subscriber file maintenance and customer service for all subscriber types.

For reference *incremental costs* (or run-on costs) are those just attributable to each additional subscription – such as the printing, distribution, and subscriber file maintenance of one subscription. Societies often price their member copies based on incremental or run-on costs.

In order to compare the same category of costs for each journal with all the others, the costs for all the journals included in the study were sorted as accurately as possible from the data supplied by the publishers

according to these fixed and variable categories. Print and online costs were also separated on the templates provided to the publishers. Several of the publishers in the study do not allocate costs by version (print and online) and so could only provide overall cost numbers, which relate to print and online versions combined. This limits the ability to assess clearly the performance of the journals according to version.

The fixed costs of publishing the journals – content creation and publishing support – increased throughout the period. Variable costs of print manufacturing fell modestly but print distribution and fulfilment costs increased to more than offset this. Over the period under review the revenue, costs and margin per page fell.

Opinions have been expressed that removing print would lower the costs of the OA business model (and publication costs in general). Naturally this is true but analysis of the purely print revenues and costs across 12 journals included in the study show that revenues would fall more than costs and as a

Serials

for the international serials community

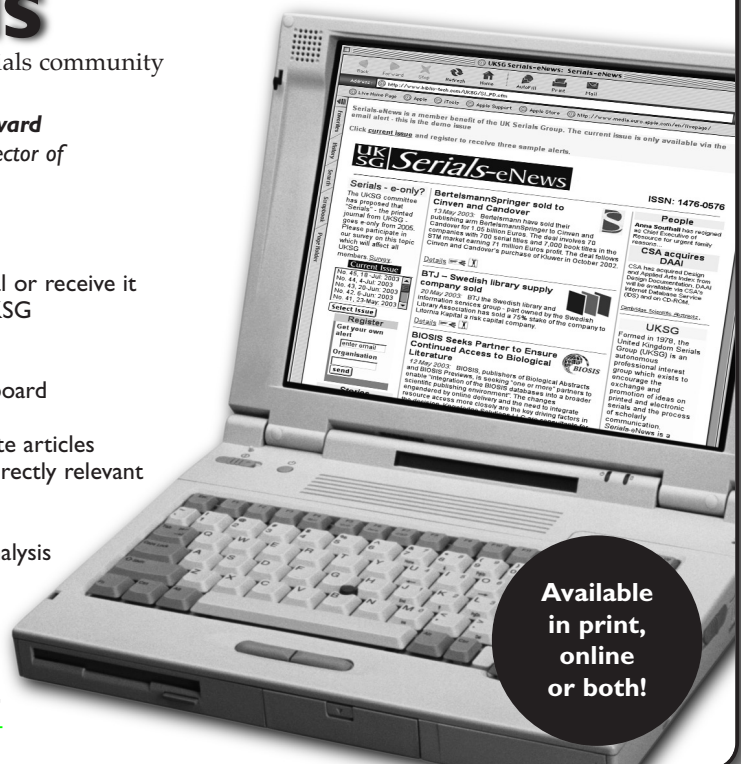
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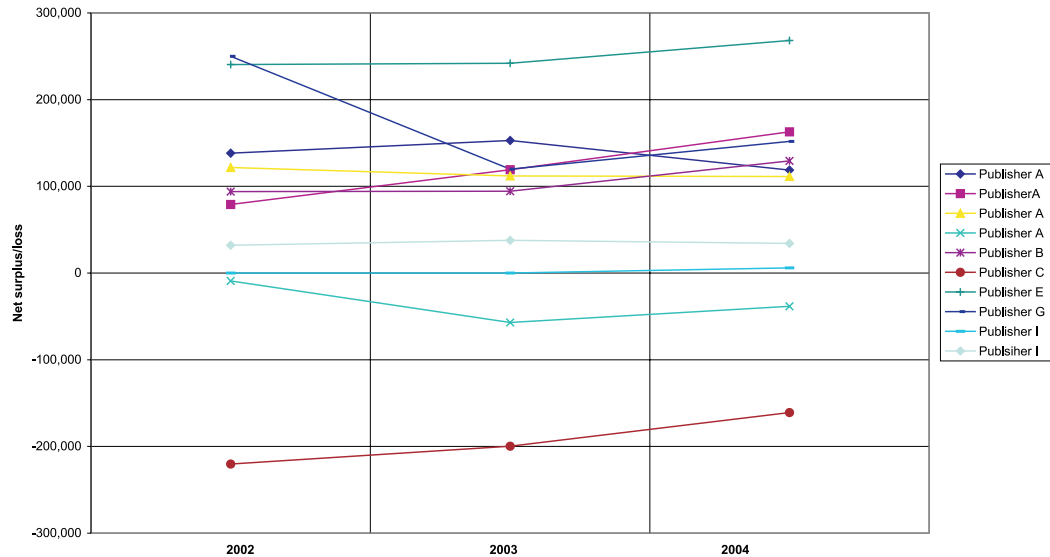


Figure 3 Changes in net surplus (£) for 10 journals, 2002–2004.

Table 3 Some results of recent OA hybrid experiments (as at June 2005)

Publisher	Journal	Fee/article for immediate OA	Take up	Comment
US National Academy of Science	PNAS	\$1,000 if not a subscriber	20%	Risen from 16% at beginning of 2005
American Institute of Physics	4 journals	\$2,000	low	
Springer	All journals	\$3,000	9 articles by April 2005	'surcharges for colour, oversized articles, and other factors (in print) may apply'
American Physiological Society	Physiological Genomics	\$1,500	11% in 2004	Now moved to page charges + \$750 for OA
OUP	Nucleic Acids Research	\$1,500 for 9 pp. article if not subscriber/'member'	92% in 2005	Now fully OA

publishing surplus would fall if print subscriptions no longer existed

result publishing surplus, based on 2004 figures, would fall if print subscriptions no longer existed. If the variable costs of print are subtracted from 2004 costs, then the average publishing cost per article falls to £956 and per page to £97. Averages cover a broad range across the journals analysed.

Surplus

The net surplus/loss generated by each of the journals varied from a surplus of 62%

(£268,000) to a loss of £161,000 in 2004. The average net surplus of 22% masks a wide divergence in business performance. Over the three-year period analysed surplus has varied as shown in Figure 3.

Recent OA journal experiments

Table 3 summarizes some results of OA experiments.

Generalized lessons have yet to emerge from the recent and current OA experi-

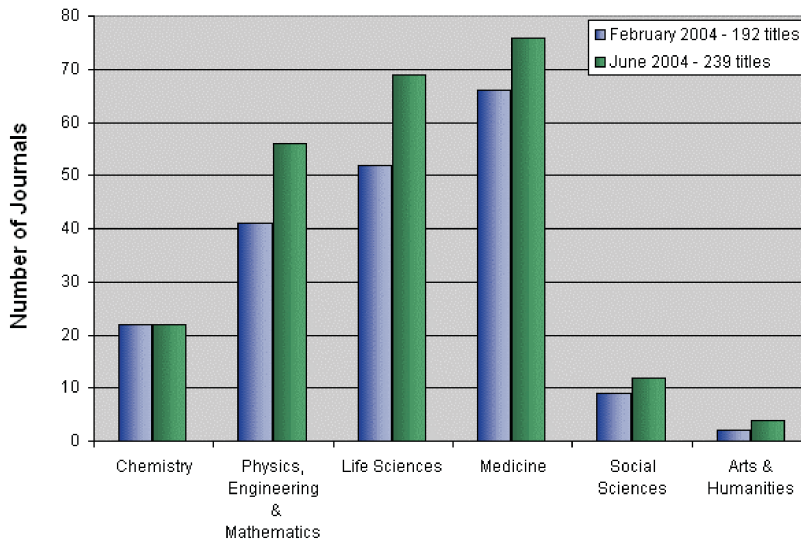


Figure 4 Change in coverage of OA journals within ISI JCR, Feb 2004–2004.

Source: McVeigh: OA journals in the ISI database: Analysis of Impact Factors & citations patterns: Oct 2004.

ments undertaken by several publishers but some themes run across the results so far and are presented here for further discussion.

(a) Within certain well-funded disciplines, notably biomedicine, if the journal is central and near the top of its field with a high rank within the impact factor ratings, funds are forthcoming from authors.

Examples include *Proceedings of the National Academy of Science* and *Nucleic Acids Research* where there is quite fierce competition to be published. Compare this with the fully OA BioMed Central journals, which published an average of 10 articles per year in 2003.

It is difficult to envisage authors preferring to publish in a less well known journal which is freely accessible to readers, but for which payment has to be made, rather than in a better known journal for which payment is not required.³

If there is already good access to the content as a result of delayed OA policies, then the uptake of the author payment model may also be low.

(b) Within less well-funded research disciplines, such as ecology and the environmental sciences, if the fees charged are relatively low, author uptake will show growth over time. For example the Entomo-

logical Society of America journals where uptake of the OA PDF reprints has reached 62% and authors also pay page charges.

...the publication charge should be set at or near the total required for online publication of the paper.⁴

The current fees charged to authors by the Entomological Society of America do not meet this requirement.

(c) Within the physical sciences and in disciplines where there is a tradition of posting online preprints centrally, OA may be virtually redundant in well-defined fields where readers can find and view new research outcomes before formal publication, and this early preprint version may be 'good enough'. Examples include the recent response to the American Institute of Physics experiment (see Table 3).

Consider also the fully OA *New Journal of Physics*, which has been slow to meet its direct costs. In order to do so a key assumption is that 'The number of published articles increases by 150%, from the present level (2003) of 161 to 400 per annum.'⁵

(d) Within certain disciplines there may be some resistance to shifting to a producer-pays model because of enduring scholarly traditions and/or questions of quality. For example Figure 4 compares the number of

some resistance to shifting to a producer-pays model because of enduring scholarly traditions and/or questions of quality

new OA journals in chemistry in the ISI database with the numbers in physics, life sciences, and medicine.

From the results reported by publishers across STM publishing, including the exclusively OA publishers, there is not yet a strong and positive 'pull' from the author community for OA of their articles despite increased financial support from funding agencies. Such a change may take a long time. Nevertheless a market is emerging for the price of publishing an article OA within existing (and newly launched) journals with OA fees ranging from \$500 to \$3,000 per article.

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Requirements by societies

The key requirements for a society journal business model to be financially sustainable include covering costs and returning a modest surplus to reinvest in innovation and ongoing support structures such as new content and functionality, and archiving of existing content. The OA model as currently construed is unlikely to meet all of these needs. Generic steps in considering a transition towards OA are presented in the study with key considerations and possible actions at the individual journal level proposed based on the detailed case studies from information provided by the publishers who agreed to participate in the study.

Appendix 1

[http://www.jisc.ac.uk/uploaded_documents/Learned Society Open Access Business Models.doc](http://www.jisc.ac.uk/uploaded_documents/Learned_Society_Open_Access_Business_Models.doc): includes tools that publishers may find helpful in analysing information about their journals as they consider a transition to OA or more broadly the print to online transition that is underway.

Appendix 2

[http://www.jisc.ac.uk/uploaded_documents/Learned Society Open Access Business Models.doc](http://www.jisc.ac.uk/uploaded_documents/Learned_Society_Open_Access_Business_Models.doc): includes brief case-studies of each of the nine publishers who participated in the study.

Conclusions and recommendations from the study

- Based on information provided by the nine learned society publishers participating in this JISC-funded study, surplus delivered by their journals is used to support any or all of the following within each publishing operation:
 - New product development – e.g. back-issue digitization.
 - New journal launches – e.g. in the emerging interdisciplinary research areas.
 - Other society activities – e.g. meetings.
 - Other activities – e.g. travel scholarships for young scientists.
- As a result either the business model selected by the publishers needs to deliver cost recovery plus a modest surplus or the society will need to find funds from other sources to support investments and Member service activities. The decision on this will doubtless need to be made at the individual society and publisher level but an active choice needs to be made in the event of falling journal revenues and surplus.
- The OA business model is attractive in principle to each of the publishers who participated in the study because it is aligned with their mission and provides increased visibility to their journal and the authors and research they publish. There was deep concern expressed over the financial sustainability of a switch to this model across the board.
- Research output is increasing expressed as articles submitted to and published by this group of publishers and both are driving up the fixed and variable costs. Higher education as a major producer and consumer of this information is not in a position to pay for all of these increased costs.
- The costs of publishing each of the journals increased year on year throughout the period 2002–2004 (up 11% over 3 years). If a journal relies on OA to support publication, then it is important that the fee for an article can be raised to take account of this. If it cannot, then OA publishers will have to rely on subsidies and alternative revenue streams that themselves will re-

Table 4 Net contribution patterns – 10 journals

Year	Highest net surplus	Average net surplus (%)	Lowest net surplus/loss
2002	60% (£240,000)	23	£220,000 loss
2003	60% (£242,000)	19	£200,000 loss
2004	62% (£268,000)	22	£161,000 loss

quire new or additional resources to generate them.

- Costs have increased as a result of increased numbers of submissions – which take time and money to handle, increased numbers of articles and pages published, higher labour costs with the need for more technically qualified staff to work with the online version, and the additional costs of publishing in dual versions which pre-dates 2002. The fixed costs of publishing have been a primary source of the increased cost levels across this group of publishers and these are costs that are not reduced by falling print runs. Total costs of the 10 journals for which three consecutive years of information was available increased by £300,000 (or 11%) over the period 2002–2004.
- The publishers are not all separating print and online costs in a way that would be helpful in predicting the impact of falling print circulation on the total cost of publishing the journal. In part this is due to the bundling of outsourced print and online services by third parties, and in part it is because there is a quite widespread view based on current trends that print cannot ‘go away’ until institutions stop wanting to buy it. As this transition proceeds it will become essential for publishers to understand their distinctly print, distinctly online, and shared print and online costs and revenues. The profit and loss template used in this study is provided as one tool to support this.
- Costs per article are driven by a number of features of the content irrespective of print or online version and these include the length of the article as well as the number and type of figures, tables, and il-

lustrations. The first language of the author can also affect the extent of post-acceptance editing of an article that is required. For example, Publisher E, which has the highest percentage of authors from Asia, noted that 95% of articles are accepted after at least one round of revisions post-review. As research output grows in Asia, editing of articles from this region will be more costly for publishers.

- Total revenues for the same 10 journals for which three consecutive years of information was provided increased by £336,000 or 10%. Since costs increased by £300,000 over the same period this means that the surplus generated by these 10 journals combined increased by £36,000.
- There is heavy reliance on institutional subscription revenue to support the journals, while the number of institutional subscriptions is falling. In contrast, the price charged to members for their society subscriptions is in general not covering the costs of providing the print journal. Online-only member subscriptions would reduce those costs and some publishers are implementing this change.
- Net margin/surplus for all the 10 journals combined was 23% in 2002, 29% in 2003, and 22% in 2004. This combined figure masks a quite wide variation in performance as shown in Table 4.
- It was not possible to assign print and online revenues precisely because five of the publishers offered only print and online subscriptions bundled for the three-year period. The allocation of costs and revenues to bundled subscriptions varies by pricing strategy and by publisher.
- Where print and online revenues were separable, print revenues (including non-subscription print revenues) fell by £110,000 (15%) while online revenues increased by £16,000 (22%). Print and online combined revenues from bundled subscriptions increased by £357,000 (14%) during 2002–2004.
- Although average numbers mask the quite profound differences in the journals analysed, the average publishing cost per article in print and online was £1,447 (range £493–2,232) and per page £144

there is heavy reliance on institutional subscription revenue to support the journals

(range £65–203) in 2004. The average revenue per article was £1,918 (range £389–3,380) and per page was £194 (range £21–538 in 2004).

- If all print costs are removed the average publishing cost per page was £97 for an average article of 9.8 pages. Above this length costs per article will increase and below them the variable costs will fall, but fixed costs will not. In determining OA fees to authors it is essential to factor in article length as is clear from the information included in this study.
- In order to cover the average online-only costs for a 10-page article and deliver the average surplus these 13 journals delivered to their societies, the OA fee per article for 2004 would have needed to have been set at £1,166.
- Journal costs for the US publisher's journals which are published in print and online are lower in every fixed and variable cost category than the UK publishers journals published in print and online. This could be due in part to the weakness of the dollar against the pound sterling, but overall costs are among the lowest of all the publishers on a per-article and per-page basis. It could also be due to this publisher's strategy of outsourcing as much of the publishing operations as possible while continuing to self-publish.
- If the US publisher's costs are removed from the group of learned society publishers' costs, then the cost/article for the UK publishers only in 2004 increases to £1,602 and per page to £156. This figure only takes account of costs and does not cover the surplus delivered by the UK learned society publishers to their societies.
- Although there would doubtless be savings and efficiencies within the publishing system from removing print it will need to be removed entirely for those to be realized and in the meantime statements that publishers should be charging OA author fees that are equal to the costs of online publication are somewhat difficult for many publishers to translate into a sum as is clear from the analysis here.
- Revenues from print deliver a considerable proportion of the surplus generated

by the journals included in this study. For the nine journals publishing both print and online formats and providing information about these costs, if print-only variable costs and print-only revenues are removed for 2004, surplus is reduced by over £300,000 and overall net surplus falls from 22% to 14%.

- None of the publishers could see substantial savings from moving to an OA publishing model, although most agreed that there should be some savings and then pointed out the additional costs incurred for administering and collecting author publishing fees and the additional costs of marketing to authors versus institutions, i.e. many individuals versus a few institutions.
- Value Added Tax is a barrier to making the transition from print to online in the UK and Europe because of the anomalous situation that protects print (and bundled print and online) subscriptions from VAT but not online only. This is not the case in North America or Asia. It is possible that moving to online and abandoning print entirely would save more than the 17.5% of VAT, but for reasons articulated in the report the move to online only is not necessarily to the advantage of all publishers because for some a considerable proportion of their current surplus comes from print subscriptions sold to institutions. Notice also that VAT is chargeable on individual OA author fees.
- For many of the publishers, institutional online pricing does not reflect the much increased usage and utility of the online version; rather it is based on the original print version.
- Author acceptance of and interest in OA – the producer-pays publishing model – is generally low but shows some variation by discipline. The landscape of this pattern of preference is becoming clearer as the various publisher experiments with a hybrid model proceed and exclusively OA journals such as those from PLoS and BioMed Central build a track record within their respective fields. As more results of the responses to OA opportunities become available they should be carefully and independently documented and

none of the publishers could see substantial savings from moving to an OA publishing model

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broadly disseminated to the scholarly communication communities for reference.

- Two key features seem most likely to influence the uptake of OA by authors as customers and publishers as service providers. Firstly, are articles that are OA from first publication cited, read, and integrated into research more, and more rapidly than subscription-only access articles? Secondly, does an open access journal receive more high-quality submissions than a competing subscription-based journal? The answers to these questions will take time and rigour to answer as there are important disciplinary differences to consider.
- There is no universal answer to the issues faced in funding publication of the research literature but alternatives need to be explored collaboratively and based on sound information. Solutions are likely to emerge on a case-by-case, discipline-by-discipline, and market-by-market basis.

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