Study on the Economic and Technical Evolution of the Scientific Publication Markets in Europe

Commissioned by DG-Research, European Commission

Comments from Elsevier

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Table of Contents

1. EXECUTIVE SUMMARY

Elsevier welcomes the opportunity to comment on the *Study of the Economic and Technical Evolution of the Scientific Publication Markets in Europe* ("the Study"). We agree with some of the Study's recommendations, particularly the need for "Further Investigation" (Recommendation C2) and to "Eliminate the unfavourable tax treatment of electronic products" (Recommendation B3). However, we are very concerned that many significant recommendations are based on mischaracterisations of STM publishing industry dynamics that follow from limited, flawed analyses and unsupported theoretical speculation. Unfortunately the Study reflects issues and concerns regarding the direction in which the industry was heading during the 1980s and 1990s, and not the very positive and very different trajectory that in reality it has been on for the last seven years. It would be unfortunate if the Commission were to consider implementing recommendations based on an inaccurate characterisation of the industry, with detrimental effects to the very sectors that the Commission seeks to benefit.

Contrary to the impression created by the Study, the STM industry is remarkably dynamic, efficient and innovative. It is making a dramatic transition as it migrates from a print world to a mixed print and electronic world. Publishers are experimenting with new business models, and have embraced new technologies. The sector is the most advanced among all professional information sectors. Researchers and institutions are benefiting from this transition in terms of access, unit costs, and productivity, while the system continues to maintain high quality standards. Stakeholders in this industry are continually and actively collaborating: publishers are working with libraries to ensure preservation of electronic data; they are funding, supporting and developing interoperable standards and technologies such as font sets, document linking systems, Digital Object Identifiers and usage metrics.

STM publishing is a remarkably efficient system, one that would likely be considered among the most efficient public and private partnership arrangements in Europe or the world. The global scholarly journals system delivers these benefits to researchers, institutions and the public for an amount that is less than 1% of the total amount spent on research and development each year.[i] Levels of cost effectiveness are further increasing as demonstrated below.

STM publishing contributes to scientific excellence, which is a key driver in making the European Union (EU) a highly competitive and dynamic knowledge-driven economy. The EU occupies a well-established and vital place in the STM system, having many world class, globally competitive publishing houses, which publish 49% of all research articles worldwide. European authors lead the world in output, accounting for 43% of all articles published yet Europe is a net beneficiary with only 32% of worldwide subscription expenditures on journals. In turn the STM sector makes a significant contribution to the EU economy employing some 35,000 people in Europe and an estimated additional 20,000–30,000 workers indirectly.

We hope that our response will help to inform the policy debate and the evolution of an environment in Europe that continues to encourage and support the great advances made by the industry in the past seven years, rather than focus on solutions to perceived problems of the 1980s and 1990s, as is the case for many of the Study's recommendations. It is structured as follows.

- Section 2 presents the facts on the current trajectory of STM Publishing, demonstrating the dramatic shift that has taken place in the last seven years since the electronic publishing revolution began. Significant benefits—in terms of access, unit costs, productivity and quality—have been realised and continue to be realised for researchers as a result of this revolution.
- Section 3 addresses specific points made in the Study, particularly about market dynamics and pricing, that do not accurately portray the current industry and yet are the foundation of a number of the Study's policy recommendations.
- Section 4 brings to bear the implications of our analysis upon the Study's individual policy recommendations. While we support some recommendations, we submit that many should not be implemented because they are based on deeply flawed analyses, unproven theoretical assertions, and misplaced conclusions.

Elsevier will be pleased to work with the Commission to help ensure it has a full fact-based understanding of ongoing market developments, in particular the transition from print to electronic which needs to be understood in depth to enable relevant and sustainable policy decisions for the future. We believe that the proposed Advisory Committee has a role to play in building an up-to-date, rigorous and complete picture of the STM sector and the numerous organic innovations that are shaping its evolution.

2. STM PUBLISHING: CURRENT TRAJECTORY

The opening paragraph of the Study notes that it was commissioned because of "current public debates that reveal worries about the conditions and of access and dissemination of scientific publications." Elsevier is familiar with these debates whose roots can be traced to the trajectory of the industry in the 1980s and 1990s, a period when journals only existed on paper in library collections, when R&D output and publication pricing outpaced library funding increases, and when higher costs to libraries resulted in subscription cancellations. Understandably, there were widespread concerns that access to research may be declining during this serials crisis, and resulting frustrations drove a desire for new publishing models.

However, the situation has dramatically changed since these debates took root, primarily due to the E-publishing revolution which has transformed the production and dissemination of scientific journals. This transformation is the result of significant investments by publishers. For example, Elsevier alone has invested well over €300 million in electronic distribution and digitization programmes: over €10 million have been invested so far in systems to process and co-ordinate the peer review of over half a million article submissions per year; over €15 million to track and prepare more than 250,000 accepted articles per year for dissemination; more than €250 million on state-of the-art digital distribution platforms like ScienceDirect; and over €30 million to digitize historic print journal collections.

The results of the end-to-end digitization of publishing systems has been a dramatic increase in the number of journals and articles accessed, significant improvements in researchers' productivity, falling costs per journal and per article for libraries, and continued maintenance of excellent standards of quality control and preservation. Taking each of these dimensions in turn:

- Access: dramatic increase in the number of journals and articles accessed
  - Researchers in large European Union (EU) libraries now have access to over 3 times as many journals via Elsevier's journal platform ScienceDirect as in 1999. Small EU libraries now have access to over 10 times as many titles.[ii]
  - Expanding access is leading to exploding usage: the number of Elsevier articles downloaded by EU researchers grew on average 64% *each year* from 13.6 million in 2001 to 60.5 million in 2005.
  - Published distribution of EU research outside the EU is also very broad. Elsevier's journals are available in print and electronic forms to around 30 million readers in some 200 countries. Worldwide usage of our electronic articles has grown six-fold in the last four years and the number of ScienceDirect regular active users has grown tenfold. Access in developing countries has also increased dramatically, and at little or no cost to beneficiary countries, through initiatives such as HINARI and AGORA [iii].
  - As a result, researchers globally now rank "access to research journals" twelfth on their overall lists of concerns. Availability of funding for research is their number one concern.[iv] Over 75% researchers globally indicate that access to scientific journals has become easier compared to five years ago, while the majority indicate that they have "good to excellent" access[v]
  - Public access is also good, as for example the UK government noted in a 2004 report.[vi] All Elsevier's Science Direct licences, for example, explicitly allow members of the public to have walk-in access to Elsevier online databases and materials subscribed to by a library.[vii]
  - Publishers are continuing to innovate to further improve these excellent access levels, for example by making articles of some journals available free on their websites after 12 months

and by participating in initiatives like Patient INFORM to make useful and relevant medical articles free to the public via patient organizations.

- Productivity: significant improvements for researchers
  - Functionality and efficiency have dramatically improved for readers, who can now perform complex searches of journals, immediately retrieve full text articles and print them on the spot, link instantly to other cited articles, export text to other databases and programs, and receive e-mail alerts when new journal issues are released.
  - Voluntary cross-publisher initiatives such as CrossRef have broadened the impact of these benefits for researchers. References in one journal article can be linked enabling direct immediate access to another article. As of May 2006, CrossRef has over 1,600 publishers or societies with publishing activities and over 14,000 journals participating in the linking system covering more than 20 million article Digital Object Identifiers. Publishers have also collectively invested in online usage reporting systems to measure productivity increases, e.g. Project Counter.
  - As a result of these productivity benefits, Science is only information sector where the amount of time that researchers spent gathering (vs. analysing) information decreased from 2001-2005, according to a recent study by Outsell Inc..[viii] No other information sector in the study experienced a similar productivity improvement. Compared to the print-only era scientists now gather 25% more articles per year from almost twice as many journals, and they do so using up a smaller portion of their time.[ix]

- Unit prices: falling costs per journal and per article for libraries
  - The effective price paid per journal has fallen dramatically due to concomitant developments in licensing alternatives, consortia buying, and various volume discounting arrangements, e.g. license arrangements that have developed in response to customer requests and that provide access to a publisher's entire portfolio of journals at moderate increases in current expenditure, often referred to as the "Big Deal".
  - For example, data from a LISU study in UK showed a greater than 20% decrease in average price paid per journal accessed by UK institutions between 1999 and 2003 whilst at the same time the number of journals purchased per institution increased. [x]
  - The effective price paid per article has also fallen dramatically because the number of journals accessed has increased (as the effective price paid per journal has fallen) and electronic usage has exploded. For example, among EU libraries the effective price paid per full text article downloaded on ScienceDirect fell from €12 to around €2 per article from 2001-2004, an average drop of 45% per year *each year*. We expect it to keep falling and to go below €1 in the next 2-3 years.

- Quality control and preservation: continued maintenance of excellent standards
  - STM publishers, via peer review and active intellectual property rights management, have been highly effective in protecting the quality and integrity of research while effecting this e-transformation, and continue to invest in mechanisms to improve standards further, e.g. via electronically enabled peer review systems.
  - While peer review on its own cannot determine whether any given paper under consideration is "correct", it filters out grossly unreliable interpretation, inadequate data or incorrect attribution of authorship. Fraud and malpractice continue to be rare, and scientists rely on peer-reviewed STM journals because they trust their integrity, knowing that such journals aggregate, filter and validate author submissions independent of any outside influence.
  - Journals preserve the scientific record for future generations of researchers to build on. Professional publishers and libraries archive over one million peer reviewed journal articles every year. Over the last hundred years they have archived over 35 million articles, and these continue to be available for use today. At current growth rates a further 50 million articles will be added in the next 25 years. Publishers have organised and licensed organisations such as the Koninklijke Bibliotheek (the Royal Library of the Netherlands, The Hague) and Portico to provide digital archival support for researchers and library customers.
  - In recent years, Elsevier alone has invested considerably to preserve and disseminate digital assets, spending over €30 million to scan and digitize past issues of its 1,800 STM journals, some of which date back to the 1820s. In 2002, Elsevier and the Koninklijke Bibliotheek (KB)

reached a groundbreaking agreement in electronic archiving when the KB agreed to be the first, official, independent, digital archive of all Elsevier journals. We are in discussions to establish a similar independent archive in the UK.

In summary, the Study notes that it is interested in the ability of the STM market "to offer cost effective and high quality levels of certification, dissemination and archiving services to the research community.[xi]" The facts above show that the market's current trajectory over the last seven years is extremely positive in these respects and that it is already well on the way towards furthering these goals.

Elsevier does not claim that the current STM publishing system is perfect. The E-revolution transition is far from complete. For example, Elsevier's Science & Technology division's journal subscription business is approximately 35% (although shrinking rapidly) print-only, 25% print-plus-electronic, and 40% electronic-only.

However, imperfections are continually being addressed organically by the market as the transition matures. Publishers are continuing to innovate, test, and invest where they see opportunities to deliver demonstrable and sustainable benefits. For example, to name just one of many journal-specific access initiatives, Elsevier's Cell Press journals, a set of premium Life Science titles, now make their articles freely available to all via our websites 12 months after final publication. A number of journals now offer an option for authors to sponsor availability of articles to non-subscribers. Through such professional publishing initiatives the industry will find sustainable ways to extend even further the very high standards that already exist in terms of access, productivity, cost-effectiveness, quality control and preservation.

Given the significant benefits delivered by a highly innovative market, its cost-effectiveness, its organically self-correcting nature, and its currently positive trajectory, we do not see a need for government to intervene. We believe that intervention in a delicately balanced system that is in transition would be at best unwarranted, and at worst could de-stabilise and undermine the continued delivery of the benefits demonstrated above.

Section 2 has provided a general picture of the current positive trajectory of the STM industry that is more complete and up-to-date than the picture portrayed in the Study. Section 3 now addresses specific analyses of the Study that our evidence shows to be deeply flawed, and which account for the Study's overall mischaracterization of STM industry dynamics. We address these points in detail to provide a more accurate picture, and to demonstrate that certain policy recommendations made by the Study should not be implemented because they are based on inaccurate or incomplete analysis, and could potentially harm the very sectors that the Commission seeks to benefit.

3. STM PUBLISHING: SPECIFIC ANALYSES

The recommendations of the Study are based, as noted, on a number of misinformed or out-dated assumptions or conclusions, all of which deserve far greater scrutiny and objective testing. Evidence that is contrary to positions taken in the Study is often ignored, sometimes noted only in passing, and never addressed in detail. Weak correlations are relied upon, making virtually all conclusions and recommendations questionable. Key points are noted below.

3.1. The STM market

Assertion: The Study asserts that there is a need to prevent "excessive concentration" in the STM sector

Facts: The STM industry is highly fragmented. It is not at all concentrated, let alone excessively so.

- The sector is comprised of over 2,000 publishers that publish around 18,000 unique refereed, learned journals and some 1.2 -1.4 million articles annually.

- The largest publisher (Elsevier) publishes around 25% of articles. Based on share of journal articles published, the HHI index for the STM journal publishers is less than 800, indicating a market that is competitive and not concentrated.[xii]
- The study itself acknowledges that "the scientific publishing market is not monopolistic" yet proceeds to use terms like "excessive concentration."[xiii]

A*ssertion*: The Study asserts that the industry has "strategic barriers to entry"

Facts: The STM industry has low entry barriers, as indicated by significant new entrant activity
- 30-40% of all existing journals were started in the last 15 years.
- 25% of all current publishers entered the market in the last 15 years in an industry that has been around for over 200 years
- New publisher entrants accounted for between 20-40% of new journals entering the market
- The pace of new entry has not declined in the past 10 years, indicating that there is no evidence of "lock-in" effects of the so-called 'Big Deals' that developed during this period.[xiv]
- The Study itself refers to the many new players adopting new business model approaches which indicate significant innovation, e.g. 1,900 titles in the Directory of Open Access Journals that deploy a range of business models, e.g. sponsorship, funding, author pays.[xv]
- See Annex 1 for supporting and additional detail

3.2. FP and NFP comparisons

Assertion: Differences between For-Profit (FP) and Not-for Profit (NFP) prices are cited as being indicative of "market power".

Facts: The Study does not convincingly demonstrate that the differences in FP and NFP prices are indicative of "market power" or that these differences are due to anything other than differences in business models. There are serious limitations to the data used and the basis for some of the comparisons made, rendering the conclusions not credible.
- The FP/NFP analysis does not reflect what libraries actually pay due to deep discounts and the multiples of print prices charged by some NFPs for e-licenses. This is because it is based on limited print subscription data (2001-2004 Swets print list price), which in the case of Elsevier's Science & Technology division's journal subscription business is only relevant for customers that account for 35% of journal revenues, a portion that is rapidly shrinking. In some cases subscribers may pay less than 25% of print list prices. Hence, the number of journals accessed by libraries has increased while the price per journal accessed has fallen.
- FP print list prices are likely to be overstated by an average of 10% (range 5-25%) and citations understated by an average of 70% (range 20-200%) because Society affiliated journals published by FP publishers were reclassified in the study as NFP. This presents a misleading picture because it effectively reduces the number of broader journals which also have multiple revenue streams from the portfolio of FP publishers. It is also misleading because FPs still have to pay taxes on any profits they earn from society journals.
- The Study acknowledges that NFP publishers have focussed on high-end journals and not supported niche areas and growth in science but does not adequately address the resultant differences, particularly between journal types and the mix of such journals within any publisher's portfolio. For example it does not quantify effects of niche low circulation-subscription base journals which typically have higher prices (often FP) vs. general high circulation-subscription base journals (often NFP).
- There are considerable differences in prices within the same publisher depending on the mix of the journals published in terms of their numbers of subscribers and their business models (see Annex 3). Not accounting for these makes the wrong assumption that the list of journals typically published by FP is comparable to that typically published by NFP. This is certainly not the case, given that FPs have been the stronger supporters of new and niche areas in science (niche titles typically have higher subscription prices because costs are distributed across a smaller base).
- The analysis does not account for the higher investments made by FP publishers in supporting niches and growth in science; nor does it account for NFP membership fee and tax subsidies or advertising support for high circulation journals.

3.3. Citations, Costs and Prices

Assertion: the Study asserts that journals with high citation counts should have lower average costs because they will have higher circulation, and therefore concludes that the positive correlation that it finds between citations and prices to be an indicator of market power.

Facts: The assertion is theoretical, has little empirical evidence and is based on a number of assumptions about the relationship between citations, quality, costs and prices.

- The study utilises field normalized total citation counts rather than citations per article and this has some implication on assumptions made. Total citations will increase with size and age of journal and therefore two journals in the same subject with the same level of total citations are seen by the study as of equal quality. However, by Impact Factor (average citations per article) these journals could be assessed as of varying quality. For example, a journal publishing 1,000 articles each getting 2 citations will have the same total citations (2,000) as a journal publishing 100 articles each getting 20 citations. In this case the perceived quality, cost base and circulation of these two journals would be very different. The study does not adequately account for this.
- The Study attempts to quantify the higher costs associated with increasing quality (e.g. of higher rejection rates), but is simplistic in rejecting the impact this has by concluding, without evidence, that "average costs should fall when citation counts increase". This invalid assumption will clearly lead to inaccurate conclusions: a journal that rejects 20 manuscripts for every one it accepts for publication will have significantly higher processing costs than one that rejects 1 to 1.5 manuscripts for every one that it accepts for publication.
- The Study assumes that production and processing costs will not vary with quality. However, high quality journals may have higher production requirements, e.g. amount of colour reproduction (for print), standard of graphical reproduction, etc.

3.4. Big Deals

Assertion: The Study asserts that so-called "Big deals" create lock-in and raise barriers to entry, making it difficult for new journals and new players to enter the market, as well as securing larger share of fixed budgets for existing big deal providers.

Facts: This assertion is based on theory, not data. Evidence does not support the theory.

- Big Deals do not result in "lock-in" of budgets. For example, in the UK Elsevier takes up a lesser proportion of total higher education library serials expenditures post Big Deals then it took up prior to Big Deals (see Annex 4).
- Take up of new journals has not been affected by Big Deals. Institutions with such deals are more likely to take up new journals than those without them (see Annex 4).
- There is no evidence of barriers to entry: analysis shows that the market is highly dynamic with a high level of new entrants (see above and Annex 1).
- There is minimal consideration in the study of demand from library consortia for Big Deals which are customer-driven not publisher-driven.
- Every customer has a choice to subscribe to any number of Elsevier journals. See detailed discussion on the many alternatives and options under Recommendation B1 and in Annex 5.
- The Study's weak conclusions regarding Big Deals stem from the fact that it relies on one US paper by Edlin and Rubinfeld that itself admits that it does not have supporting data.

3.5. Mergers and Price Increases

Assertion: The Study claims that mergers lead to higher price increases, asserting that publishers with larger portfolios have an incentive to set higher prices.

Facts: There is no empirical evidence that concentration results in higher prices or that higher prices have resulted from increases in concentration. The evidence of Elsevier shows the exact opposite.

- Elsevier is the largest STM publisher and acquired Harcourt in 2001. However, its list price increases in the past 5 years have been amongst the lowest in the industry, and its prices are

roughly at the industry average on a per article basis, below those of 10 other publishers that represent some 2,000 journals (See Annex 2).

- Elsevier's price increases in the five years since the acquisition of Harcourt have been around 5.5%. That compares favourably to the five years preceding the Harcourt acquisition when annual price increases were around 12%. Specifically, in this subscription year (2005-2006), Elsevier as the largest commercial publisher in the industry has the lowest price increase of the all major commercial publishers in the industry.[xvi]
- The Study's conclusions are based on one study by McCabe that is theoretically and empirically flawed. More recent and comprehensive analysis suggests that McCabe has not identified a statistically significant relationship between mergers and journal price increases. It found no evidence that mergers created market power or resulted in systematic price increases. [xvii]

4. COMMENTS ON SPECIFIC RECOMMENDATIONS

Section 2 has demonstrated that the STM Market has been headed on a positive trajectory for the past seven years. Section 3 has demonstrated that the Study portrayed a different picture largely because some of its conclusions are based on deeply flawed analyses, while others are not supported by any fact-based analyses at all. A number of policy recommendations are based on these conclusions, and even then tenuously, especially those concerning access (A1, A4), Business Models (A2), and Pricing (B1).

We have serious concerns about these recommendations: they are not warranted and could have detrimental effects. In this section we address each of the recommendations in turn.

A1. Guarantee public access to publicly-funded research results shortly after publication

The Study recommends that Research Funding agencies should "follow the lead of the NIH and other institutions and support the archiving of publications in open repositories."

Our view is that this recommendation is not needed, would not increase access levels, could lower quality control standards, and would duplicate system costs thereby wasting funds that could be spent on funding research. More importantly, there are serious potential risks associated with promoting this approach that EC should understand in detail before proceeding.

Impact on Access levels:

- Section 2 demonstrated that current system already provides excellent access to publicly funded research. The Study does not demonstrate quantitatively that access is an issue. We therefore do not see the need for this recommendation.
- Moreover, this recommendation is highly unlikely to increase access levels. Today, repositories collectively provide access to around 2% of all research articles. Even if all papers resulting from European Research were deposited, a system of repository coverage would be less than 50%, significantly less than the 90%+ access levels that many EU countries have today via the current subscription system. Actual impact is likely to be far less: less than 5% of NIH funded authors choose to archive their manuscripts because they do not see the need given existing high access levels, even though they have more incentive to ensure their work is visible than any other stakeholder. [xviii]
- To the extent that the European Commission believes access is a problem, it would be far better to work with publishers to locate and close the small specific access gaps that remain than to promote authors to deposit in IRs to attempt to close IRs' current 98% coverage gap. It is inconceivable that this 98% gap would ever be closed, and attempting to do so would open up the current system to potentially widespread plagiarism and other forms of corruption that the current model polices.

Impact on quality control standards:

- Implementing this recommendation could result in a reduction of existing levels of quality control: a recent Elsevier survey of over 5,000 researchers showed that less than 35% totally

trusted the content of IRs. While publishers maintain integrity and full control over the definitive published versions of articles in journals, the content management strategies of repositories is largely unexplored.

- Documents in repositories are generally not protected and can be altered to differ from the published versions that were subject to rigorous peer review controls. Repositories contain many different versions of documents such as annotated copies of published journal articles, amended accepted author manuscripts, and unaltered manuscripts. As a result, documents held in repositories do not provide readers with the high levels of quality assurance that peer reviewed articles on publishers' websites do.
- Neither publishers nor EU institutions can possibly monitor all the diverse repositories and the materials they contain to guarantee their accuracy or authenticity. Even if repositories supposedly contain the definitive final articles, they can always be altered without detection. In the current system where the final published article only resides in one place, publishers can and do explicitly guarantee the authenticity of the definitive published journal article and the research findings presented therein.

Impact on system costs:

- This recommendation would divert spending away from funding research which is first on the list of researchers' concerns towards attempting to improve access which is twelfth on the list of researchers' concerns. This would not be a judicious use of funds.
- This recommendation would duplicate publishing system costs by effectively developing a parallel publishing system that would almost certainly not increase access levels and that would potentially jeopardise quality control standards.
- The Study notes that "more work needs to be done on the long-term sustainability of open repositories and on the cost/benefit to their founding organisations."[xix] We agree. However, implementing this recommendation without understanding cost effects would be premature.
- Our analysis indicates that the cost for EU institutions to establish and run Institutional Repositories (IRs) would be significant. For example, in the UK alone we estimate that the cost for UK Higher Education Institutions (HEIs) to establish and run a system of IRs could be as much as £17 million per year, around 80% (or over £13 million) of which would related to the costs to archive research papers.[xx] In total UK HEIs would pay 2 to 5 times more than what they pay today in subscriptions, while gaining no discernible benefits in access.
- Future costs to maintain and administer IRs will be even greater than these costs to establish IRs. Significant technical expertise and resources will be required to develop and maintain repositories over time.[xxi] If repositories experience significant increases in usage, then the cost structure to maintain and upgrade their archives with search and retrieval capability will become an order of magnitude greater, comparable to those of commercial publishers today.

Serious potential risks

- There are serious potential risks associated with promoting and supporting archiving of publications in repositories that we believe could detract from both the EC's and Elsevier's objectives and—albeit unintentionally—adversely affect medical and scientific authors and readers, and all the publishers that serve them.
- Research shows that across all fields the majority of an article's lifetime usage happens in an extended period after it has been published. Budget-strapped libraries may be tempted to cancel titles if they know their readers can still access many of the articles contained within them after a relatively short period. A recent study by ALPSP found that 53% of librarians surveyed agreed that open access archives are an important factor in determining journal cancellations now, rising to 81% in the next 5 years.[xxii] Niche publications in specialized fields with small local reader bases and concomitant higher prices are especially at risk.
- The result would be less choice for authors who would have fewer journals in which to publish and a reduction in the system's overall quality and capacity. The possible reduction in number of peer-reviewed journals would not be good for authors, researchers, the general public, or EU funded research. If learned societies' journals' revenues (which include revenues they earn from for-profit publishers that they contract with) are reduced, so too will be their ability to fund meetings and conventions, scholarships and grants, lecture series, advocacy for research and health policy, and the provision of health information to the public via print and electronic materials. A reduction in journal revenues could endanger the

continuation of certain societies and smaller publishers, which would further reduce the breadth and quality of STM published output.

If in spite of this input the EC proceeds with this recommendation, we strongly recommend that it includes publishers in defining the precise timing, location, and format of documents to be archived. For example, while 12 months may be a workable timeframe for NIH funded research in fast-moving biomedical fields, it is not likely to be long enough in many other disciplines. Even within one field, one size does not fit all journals.

A2. Aim at a level-playing field in terms of business models in publishing

The Study recommends that "it seems desirable for experimentation and competition between various possible business models, which means allocating money to libraries to subscribe to reader or library-pay journals, but also to authors to pay for publication costs in author-pay journals, and researchers in the reader-pay model."

While we strongly support ongoing business model innovation, our view is that this recommendation is not needed, and requires an in-depth assessment on quality control levels and costs implications.

- In our view, this recommendation is not needed because existing levels of business model innovation are very high in STM publishing as a result of healthy market dynamics. The Study itself notes that "the number of Open Access journals has grown steadily" and that in 2005 "the Directory of Open Access Journals records over 1,900." It also cites other innovations such as delayed Open Access and hybrid models. [xxiii]
- Artificially allocating funds to support author pays journals and other business models that are as yet unproven in fact creates the opposite of a level playing field. The UK Government noted this in 2005 when it recommended *not* prescribing the author pays model in order to *facilitate* a level playing field.[xxiv]
- The Study notes "Our main conclusion at this point is to stress the need for further study in order to assess the feasibility and desirability of these alternative models."[xxv] We agree with this view, particularly because many significant questions about the financial viability and effects on quality standards remain unanswered at this point.
    - For example, preliminary analysis suggests that the EU would pay over 30% more under a full author pays system: it accounts for 43% of articles, while it currently pays only 32% of total subscriptions and is a net beneficiary of the current system.[xxvi] Transitional costs to such a system could be even higher if access was temporarily funded by both subscriptions and article fees.
    - In terms of quality control, a major study by ALPSP has questioned peer review and editing standards of some alternative models.[xxvii]
- Until these questions have been answered it would be premature to allocate funds to support any business model whose long-term implications are not well understood. Levels of organic market-generated innovation are sufficiently high that these questions will be addressed without the need for intervention.

A3. Extended quality rankings of scientific journals

The Study recommends that in addition to measures relating to scientific quality, journals could be tracked in terms of the "quality of dissemination (self-archiving authorisation, publisher archiving provisions, copyright provisions, abstracting and indexing services, reference linking, etc.)…which would naturally induce publishers to stress good practices in these dimensions."

Like most publishers, Elsevier supports and is actively engaged with initiatives to disseminate published research. While we support the principle, we are unclear about the need for the recommendation, as the market is already organically delivering these functionalities, and metrics to measure them. For example, CrossRef has over 14,000 journals participating in the linking system covering more than 20 million article Digital Object Identifiers. Publishers have also collectively invested in online usage reporting systems to measure productivity increases, e.g. Project Counter.

The University of Nottingham's Sherpa/Romeo database maintains details of the archiving provisions of 154 publishers that account for the majority of STM articles published globally.

Elsevier's view is that organic market forces should continue to define initiatives to monitor journal dissemination practices to ensure that these measures reflect genuine market needs. Attempts to design and impose such metrics centrally could result in metrics that reflect special interests rather than the objective neutral measures that naturally emerge by serving market needs. Allowing these to evolve naturally with all parties involved is likely to lead to more useful criteria.

A4. Guarantee perennial access to scholarly journal digital archives

The Study recommends promoting business models for legal deposit libraries to allow remote online access to their journals' digital archives…investigating the feasibility/desirability of the creation of a European non-profit journals preservation organisation…and to determine the standards under which archives must be accessible and set up as a portal as a central access point to digital journals and articles"

Elsevier has been a leader in developing mechanisms to preserve published STM content in perpetuity: we established an independent digital archive guaranteeing permanent access to critical scientific and medical research, and we work with national libraries such as the Royal Library of the Netherlands, the Koninklijke Bibliotheek, (KB) reaching a groundbreaking agreement in 2002 when the KB agreed to be the first, official, independent, digital archive of all Elsevier journals. We signed a second archival agreement in 2005 with Portico, a non-profit archiving agency and are in discussion with other potential archival partners.

While being a strong proponent of long-term preservation, we cannot support this recommendation which suggests that mechanisms that have been developed to *preserve* STM content should serve as the basis to provide universal *access* to that content. Preservation initiatives and legal deposit archives are restricted to the use of institutions that hold them so as not to undermine the primary market that allows publishers to recoup the investments required to publish those materials in the first place. The use of deposit materials under legal deposit arrangements to provide universal access would be an improper use of such materials and a violation of copyright law. There is also a material difference in the cost of creating a preservation system than to run a customer-facing service-oriented transaction system that serves millions of users every year. It would be naïve to imagine that a system designed for digital preservation would be sufficiently robust to do both.

A5. Foster interoperable tools to improve knowledge visibility, accessibility and dissemination

The Study suggests this could be achieved by "supporting research and development on interoperability issues" (e.g. metadata to improve search and retrieval efficiency, on the XML format to improve and accelerate the overall publishing process) and "promoting the wide implementation of linking technologies (e.g. Open URL) and of interoperable standard protocols e.g. OAI-PMH"

Elsevier supports the principle of promoting interoperable tools to improve knowledge visibility, accessibility and dissemination. Indeed, Elsevier has been a leader in developing such tools both internally (we created Scirus, a free-to-all science-specific Search Engine that has won multiple awards, and recently launched Scopus, the world's most comprehensive interoperable science search and retrieval tool), and externally, for example we are a founding member of Cross Ref. We welcome initiatives that will constructively accelerate the significant work already being carried out collaboratively by existing stakeholders that have been working together for years on these issues, e.g. publishers, libraries and researchers.

B1. Promote pro-competitive pricing strategies

This recommendation is one of three (B1, B2 and B3) based on the "need to prevent strategic barriers to entry and to experimentation and also to excessive concentration." Recommendation B1 specifically suggests following "simple rules" such as electronic access prices not depending on

historical print prices; relating prices to "transparent indicators like usage or the number of faculty, students, etc."; allowing libraries to choose among "variable dimension bundles" and avoiding "having prices increase with usage as long as publishing costs do not increase in usage."

Sections 2 and 3 demonstrate that the assumptions on which this recommendation is based are incorrect, being derived from flawed analyses and unsupported assertions. Facts clearly show that strategic barriers to entry do not exist, barriers to experimentation do not exist, and that there is no evidence whatsoever of "excessive concentration". Therefore, we see absolutely no basis for the need to intervene in this market, which is well-functioning, dynamic and competitive.

We challenge not only the assumption on which Recommendation B1 is based, but also the specifics of the recommendation itself:

- Electronic prices are currently related to print subscription prices because of the stage of the market's evolution. While many publishers might prefer to sell only electronic content, the majority of customers still demand and purchase print versions of journals, even though it would often be less expensive to subscribe to an e-only version. Forcing a disconnect between print and electronic journal prices at this stage would be impractical and premature.
- Many publishers and journal distributors are experimenting with usage and/or faculty or student based pricing. Such experiments should be allowed to evolve organically in response to genuine market needs. They are unlikely, however, to be a panacea and may simply transfer costs, for example, from small research-intensive institutions to large teaching-oriented universities. We recommend first quantifying the cost/benefits to assess whether such approaches would benefit or disadvantage EC member countries and institutions.
- We agree that libraries should have the possibility to choose among variable dimension bundles, which is why Elsevier enables its customers to select any combination of its journals. Customers may subscribe to none, one, all, or any number in between of Elsevier titles. The recommendation to allow "libraries to choose among variable dimension bundles" suggests that the Study does not understand that licensing options already allow this. In Reed Elsevier's prior submission in connection with the Study and in the attached Annex 5, and even in the article by Edlin and Rubinfeld relied upon by the Study, there is clear evidence of a wide variety of customer options. The Study chooses to ignore any evidence of license options other than those that provide for large collections of journals at significant discounts, and certainly does not discuss such alternative options at all, thus giving an inaccurate impression of limited offers from publishers.
- We agree that usage is on the rise (in the case of Elsevier by around 20% per annum), and are pleased that the Study acknowledges this sign of the positive trajectory of the STM industry. However, the notion that "prices should not increase with usage as long as publishing costs do not" seems to imply that costs will not increase with usage. This is clearly not the case: the infrastructure that Elsevier requires to serve over 30 million global users with 250 million annual article downloads growing at around 20% per year will clearly incur greater costs than zero article downloads in a print-only environment.
- In Elsevier's case the situation is the following: over the past two years we published on average some 4.5% more articles annually, we supported a more than 20% annual increase in the number of articles downloaded, and we absorbed the effects of inflation while the average increase in the license fee for a typical Science Direct contract increased by 5.5% annually. We have been able to keep our price increases moderate and in fact the effective price paid per article downloaded has been going down.

B2. Scrutinize future significant mergers

The Study suggests "the market has become more concentrated" and that "publishers with larger journal portfolios have incentives to set higher prices."

- Elsevier regards the need to scrutinize future mergers as self-evident and we support the recommendation to scrutinize future significant mergers. We see no evidence of failure to scrutinize mergers, of "excessive concentration", or that mergers lead to higher than average price increases. On the contrary, we have presented factual evidence to show the opposite: since Elsevier, the largest commercial publisher in the STM industry, merged with Harcourt,

our price increases have consistently been in the lowest quartile in the industry, while our listed print prices on a per article basis are roughly at the industry's average.[xxviii] In the five years since the acquisition of Harcourt we have been able to keep our price increases moderate (around 6% on average) which compares favourably to the five years preceding the Harcourt acquisition when annual price increases averaged around 12%.

B3. Promote the development of electronic publications

The Study recommends "eliminating the unfavourable tax treatment of electronic publications," and encouraging public funding and private partnerships.

Elsevier supports eliminating the unfavourable tax treatment of electronic publications and welcomes the "further discussions and study" that are proposed. We hope that these activities will identify practical ways of addressing the issues described.

C1. Set-up an advisory committee

The Study recommends "discussions with all stakeholders" and advises setting up a committee of "the various interested parties: publishers, librarians, funding bodies, authors and researchers."

Elsevier welcomes discussions that facilitate fact-based information generation and sharing, and that can help inform the ongoing development of initiatives that may deliver demonstrable, sustainable improvements to research communities. We hope that such mechanisms will lead to a more complete understanding of the current trajectory of the STM industry by all parties, for example in terms of access levels, unit costs, researcher productivity, quality control and preservation standards. We agree that such a forum would provide a useful way to share the results of the numerous innovations that are already taking place in this market, e.g. that are testing the effects of new access models, interoperable technologies, usage- and/or faculty/student-based pricing.

C2. Further Investigation

The Study recommends further investigation in such areas as copyright provision, economic analyses of alternative forms of dissemination and technological developments.

Elsevier welcomes further fact-based research in these areas. We agree that there are many unanswered questions, for example about "the feasibility/desirability of alternative publishing models…and the long-term sustainability of open repositories."

CONCLUSION

We completely concur with the conclusion of the Study that more work and investigation is needed. Given that the Study clearly indicates the need for further information and analysis, we question how the Study authors can objectively make the recommendations A1 ("support recommendations in open repositories") and A2 ("to allocate money to libraries to subscribe to reader or library pay journals but also to authors to pay publication costs in author-pay journals, and to researchers in the reader pay model.") In our view, further investigation based on fact-based analysis of existing market innovations should precede and inform policy recommendations in these areas, not vice-versa.

Elsevier is passionate about publishing and is a trusted operator at the leading edge of European STM information. We are committed to pushing the frontiers of the industry and to fuelling a continuous cycle of exploration, discovery and application. We will be pleased to work with the Commission to ensure it has a full understanding of ongoing market developments, in particular the transition from print to electronic which needs to be understood in depth to enable relevant and sustainable policy decisions for the future.

ANNEXES

Annex 1: New Entrants in the STM Industry

To illustrate the dynamism of this industry and ease of entry, a review has been undertaken of available third party and internal Elsevier data in an attempt to quantify new entrants.
Two sources have been reviewed:
1. The ISI (now Thomson Scientific) database of STM journal articles;
2. Ulrich's International Periodical Directory;

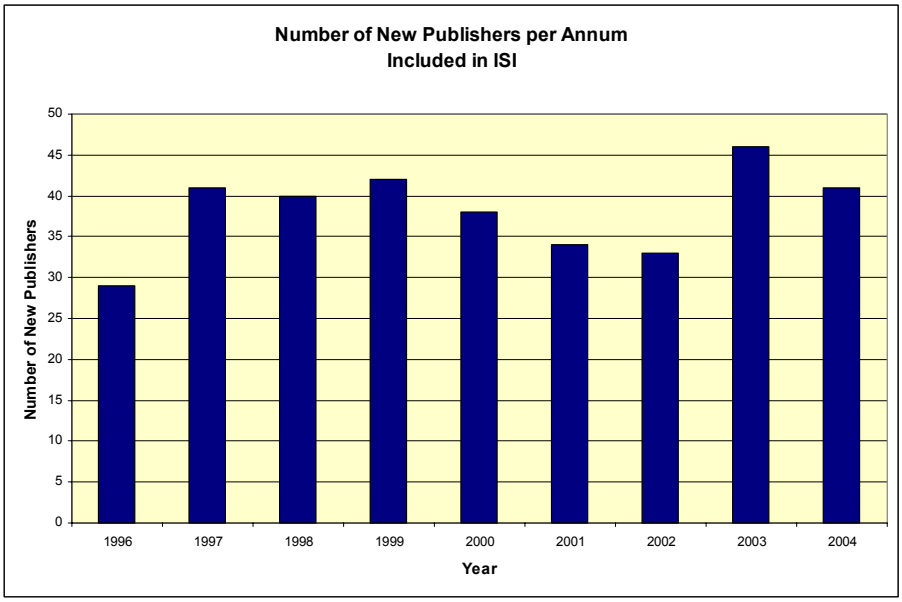
Both ISI and Ulrich's provide data relating to STM Journals that can be used to find indications of the number of new STM entrants.

Institute for Scientific Information (ISI) data study

ISI data available for analysis cover the period 1981-2004. As at 2004, a total of 8,764 active journals were included in the ISI data. ISI also provides information on the publishers albeit that the same publishing group is sometimes represented multiple times in ISI by variant names. For example ISI differentiates between Adis, Aspen, Lippincott, which this study regroups internally under the umbrella Wolters Kluwer. These 8,764 journals are, by Elsevier's analysis, produced by 2,290 separate publishing groups.

The data was analysed to identify new publishers and new journals. A publisher was deemed to be "new" if the following criteria were met:
1. It did not appear in the ISI dataset in the period 1987 – 1989
2. It appeared in the dataset in the period 1990 – 2004
3. It was still in existence, publishing at least one article in each of 2003 and 2004

Based on this methodology, some 597 new publishers appeared in the ISI database in the period 1990 – 2004, 26% of the total number of publishers at the end of the period.
Using the same criteria a total of 3,810 new journals appeared in the ISI database, approximately 44% of the total. New publishers accounted for 706 new journals in the database, or 20% of all new journals launched in the same period.
The number of publishers appearing for the first time in the ISI database in each year between 1996 and 2004 is shown in the chart below:



Ulrich's data study

Ulrich's Periodical Database is more exhaustive than ISI and covers in total some 200,000 publications of all types. Elsevier's analysis was restricted to those periodicals defined by Ulrich's as "Refereed, Academic and Scholarly" and still "Active". In 2004, this covered 21,391 journals produced by some 8,700 publishers.
During the period 1989-2004, in total 2,176 new publishers appeared in Ulrich's - approximately 25% of the current total number. These new publishers launched 2,697 new titles over the period.
The total number of new journals in the period, i.e. published by existing and new publishers was 7,289. New publishers therefore produced some 37% of all new journals during the 1989-2004 period.

Overview:

	Total at end of period	New during period	% New during period
ISI			
No of publishers	2,290	597	26.1%
No of journals	8,764	3,810	43.5%
No of journals published by new entrants	-	706	18.5%
Ulrich's			
No of publishers	8,700	2,176	25%
No of journals	21,391	7,289	34%
No of journals published by new entrants	-	2,697	37%

Period covered: ISI 1990-2004
Ulrich's 1989-2004

Comments on the data from ISI (Thomson Scientific) and Ulrich's

Both ISI and Ulrich have some time lag before incorporating new journals.

- ISI determines the suitability of a title for inclusion based upon its visibility in the STM segment, scientific relevance and number of citations. A journal therefore needs to build credibility before being included by ISI. ISI does not trace the year of launch of a journal, but is a better source to identify the publisher of a certain journal.
- The Ulrich selection is broader as they attempt to identify all journals regardless of their quality or relevance. There can nevertheless still be a lag before a title is included – for example if Ulrich's Editors are not immediately aware of it. Ulrich identifies the date of launch of the first issue, and is therefore a better source to assess the year of first entry.

The effect of this time lag will be to understate the number of more recent entrants.
The data also underestimates new publisher entrants due to merger and acquisitions activity. Where a new publisher is subsequently acquired by another, existing, publisher (for example Rapid Science (acquired by Wolters Kluwer) or Current Science (acquired by Elsevier)) only the current publisher name is available in the ISI data. The prospect of being acquired at a price that values the journals going forward acts as a powerful inducement to drive continuing entry by entrepreneurial publishers.

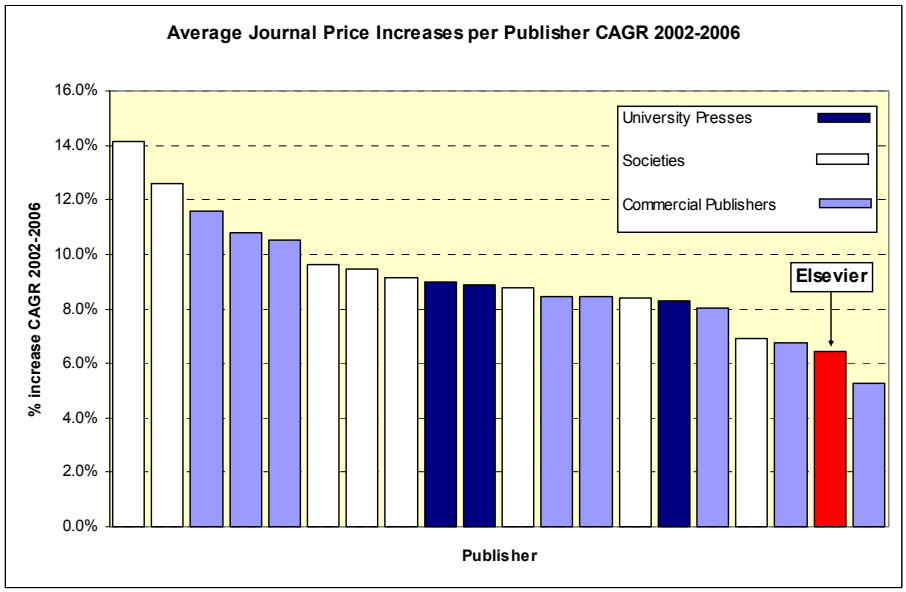
The table above shows that a substantial portion of the new journals is launched by new entrants, some 20% according to ISI data and some 37% according to Ulrich's data. ISI probably overstates the number of new journals, whereas Ulrich's tends to overstate the number of new publishers. Elsevier believes that on average some 30% of the annual new launches are attributable to new entrants.

Annex 2: Price Increases and Average Prices

Price increases

The chart below shows the annual subscription price increases for 20 publishers in the period 2002 to 2006. Not for profit publishers (societies and university presses) increases were on average higher than for commercial publishers. Elsevier's price increases were amongst the lowest.

Average price increases for last five years (2002-2006).



Source: Publisher price lists. Sample represents 20 publishers whose pricing data was available for entire period 2001 to 2006. These publishers represent over 5300 journals.

Average price per article

The study sampled 41 publishers (commercial, university and presses and societies) for which pricing information (journal subscription prices) was available for the two years in the study 2003 and 2004. Pricing data for journals was matched with article data from ISI (Thomson Scientific). Only those journals with both pricing and article data were included. The results represent the average of two years, 2003 and 2004. Publishers were ordered by resultant average price per article (PPA). The table below further aggregates (with the exception of Elsevier) publishers into roughly equal groups representing some 600 - 900 journals.

	No of publishers in study	Journals matching pricing & ISI data	Total Articles ave 03/04	Ave no articles per jnl 03/04	PPA 03/04
Highest PPA	6	937	63814	68	$20.50
	4	881	72983	83	$14.00
Elsevier	1	1300	206071	159	$10.39
All Publishers (**Ave**)	**41**	**4334**	**522732**	**121**	**$10.07**
	9	610	54949	90	$6.99
Lowest PPA	21	606	124916	206	$3.26

Elsevier's listed subscription price per article is close to the average for the 41 publishers in this study.

Annex 3: Determinants of and variation in Institutional subscription prices

- Three key determinants of institutional subscription price are: size (no of articles; no of pages), circulation and, related to circulation, subsidies or revenue streams from sources other institutional subscriptions. Other revenue sources include: membership or individual subscriptions, advertising, conferences, page or author charges, tax subsidies (e.g. for societies and university presses), etc.

Relative ratios of Price per Article for journals (published by Elsevier) based on sample of 72 journals (where 1 = lowest and all other prices are multiples of this)

		Number of Institutional Subscriptions (world-wide)		
		Low	**Medium**	**High**
		less than 300	***300-700***	***more than 700***
% of revenue from other sources (i.e. not inst. subs)	**Low (less than 10%)**	14	10	6
	Medium (10-30%)	10	6	5
	High (more than 30%)	9	3	1

- In this example the per article price for a journal serving a niche with low number of institutional subscriptions and little or no other revenue streams can be 14 times that of a journal serving a broader community, with high number of institutional subscriptions and higher proportion of revenues from sources other than institutional subscriptions.

- The mix of journals and their business models will therefore greatly affect the “average” price in any publisher’s programme. The average institutional subscription price for a publisher supporting only broad areas or one with a high proportion of society titles with revenues from individual members and advertising will be lower than for a publisher which also supports many niche areas of science where institutional subscriptions are the main revenue source.

- A publisher may have a larger range of prices depending on the types of journals supported. The above example based on just 70 journals shows that there is considerable range at Elsevier, which has a mixture of journals supporting many small niches as well as some of the broader areas of research.

- Comparing one publisher with another needs to take into account the different journal types and business models available. A large publisher such as Elsevier will have as many journals at the lower price end as a small/medium publisher or society focussing only on the broad, high circulation journals. However, larger publishers also serve many small niches where the price per article will, of necessity, be higher.

Annex 4: Big Deals

Assertion: The so called "Big Deals" tie up budgets and therefore limit the monies available for new entrants (journals or publishers).

Fact 1: **Elsevier share of spend at big deal institutes has declined, leaving more to be spent on new entrants or other publisher offerings**

Elsevier publishes about 25% of research articles in serials. Its share of UK higher education spend on serials is around 22%. The proportion may vary from institution to institution depending on scope and size. For the three years 2002 to 2004 (2004 is the most recent data available on total institutional expenditures from SCONUL), the proportion of higher education serials expenditures that were spent on Elsevier journals has declined slightly. The decline is greater for institutions that chose to take the Elsevier collection deals (referred to as the big deals).

Elsevier serials expenditures as % of total serials expenditures at UK Higher Education Institutions*

no of inst	choice made	2002	2003	2004
79	"big deals"	24.9%	23.3%	22.7%
23	Non big deals	19.8%	19.7%	20.0%
102	All	22.8%	22.4%	22.0%

* for which three years of data consistently available in SCONUL datasets
sources: Elsevier; SCONUL, LISU

Note: The big deal and non big deal institutions are not matched in size and scope. The differences in percentage of spend on Elsevier journals between these two groups is a reflection of size and scope and not the choice of deal made.

In 1999, pre so called big deals the then Elsevier organisation (prior to the acquisition of Harcourt) published about 20% of all research papers and represented 20% of the total UK higher-education-spend on serials. In 2004 Elsevier journals, including Harcourt, published around 25% of all research articles and represented around 22% of the total UK higher education spend on serials.

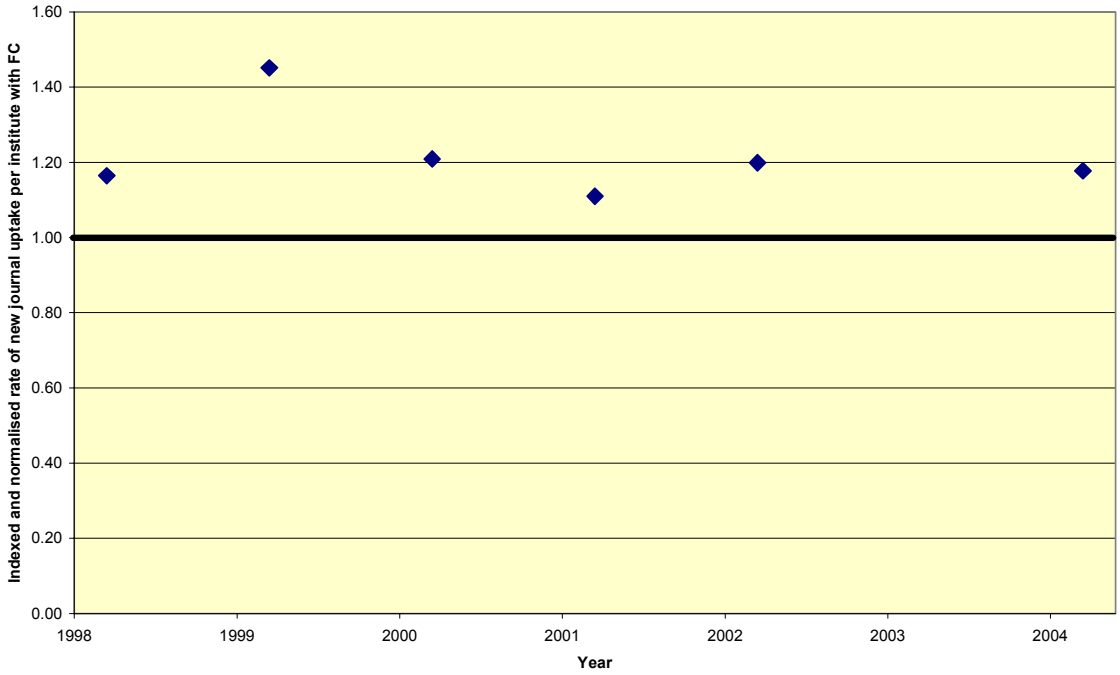
Fact 2: Analysis of uptake rates of newly-launched journals by libraries with or without the Elsevier Freedom Collection (FC) shows that FC institutions take-up of new journals in higher relative to non FC institutions and that this has not changed over time

Data collection:
A random selection of journals was defined across all subject fields that were launched in 1996 through 2004 (excluding 2003, for which no data were available). Those published by Elsevier were excluded from the analysis, as these will be automatically added to the collection of those libraries taking the Freedom Collection (FC). Thirty libraries taking the FC since it introduction in 2001, and 21 that have not, were selected with some care to ensure that libraries served institutes of similar size and broad subject coverage. Online library catalogues were searched to determine if each institute had ever subscribed to each new journal.

Data analysis:
The FC and non-FC library cohorts were treated as independent groups, and the sum total of new journal subscriptions from each year subscribed to by each cohort was determined. This raw figure was divided by the number of newly-launched journals from the same year to determine a normalised rate, which was itself divided by the number of institutes in the appropriate cohort to produce a normalised rate of new journal uptake per institute. To more clearly see the difference between the two cohorts, the value of the FC cohort was divided by the value of that for the non-FC cohort to produce an indexed value. Where this index is equal to 1, both cohorts took subscriptions to newly-launched journals at the same rate. Where greater than 1, the FC cohort has demonstrated a greater propensity to take subscriptions to newly-launched journals.

Analysis:
The chart below clearly shows that libraries with the FC have, on average, a greater propensity to take subscriptions to newly-launched journals than non-FC libraries. As this period covers that in which the Elsevier FC was introduced (in 2001), the chart also reveals that there has been no change in the ability of institutes with the FC to take subscriptions to new journals in that time relative to those that did not take the FC.

New journal uptake at institutions with Elsevier's freedom collection (FC). Shown as ratio to new journal uptake at non freedom collection institutions



So, for example, in 2002 and in 2004 institutions with Elsevier's freedom collection (FC) were 1.2 times more likely to take up new journals (non Elsevier) than non-FC institutions.

Annex 5: ScienceDirect Options

Elsevier customers have and choose from numerous subscription options

Institutional research customers have had to make a significant transition from purchasing (multiple copies of) print subscriptions to negotiating license agreements for access to electronic journals. Most in the scholarly community would agree that the electronic environment offers considerable advantages over the print and paper environment, such as the possibility of creating searching and linking tools, and the capacity for multiple simultaneous users, and yet there is no clear consensus on the part of customers as to the value of the journal content in digital form. Most scientific publishers started pricing electronic journals in the mid-1990's from the presumption that the fee the customer paid previously for print subscriptions was an appropriate measure of that value, with some incremental increase for the increased investments and functionality of the electronic or online systems. Most pricing for electronic access licenses still begins with prior print expenditures, although Elsevier began to provide additional "ad-hoc" offers and options to customers in 2002, as described more fully below.

All of the nearly 1800 Elsevier journals are available, either directly from Elsevier or through subscription agents chosen by library customers, for traditional year-to-year print subscriptions. Institutional print subscription prices are posted on the Elsevier web site (taking the place of traditional catalogues) months before the (subscription) year begins, for the benefit of library customers and subscription agents. Library customers select print journals or renew subscriptions on an individual title basis. For most of the Elsevier journals, a print subscriber also has an option at no additional charge to access an electronic version of the journal, and can browse, print and download content from a rolling archive of the prior 12 months of journal issues. These "web editions" however do not have the searching, linking and personalization functionality of Elsevier's full-fledged electronic product "ScienceDirect®", as described below.

All but a few Elsevier journals are also available online through the ScienceDirect® system, accessible via the web site "sciencedirect.com" ("ScienceDirect® online" or "SDOL") or alternatively can be delivered to library customers for local installation by the library customer on their internal computer network ("ScienceDirect® On Site" or "SDOS"). There are two core options that customers can choose from, in addition to negotiated license arrangements with consortia (groups of libraries who share access and resources or act as a negotiating agent). The two core options are the **Limited** and **Complete** options, with two very important additional choices available to customers. One additional choice possible is to forego print copies altogether and choose an "e-only" option (discount of 10% for Limited and Complete customers), and e-only licenses. In addition, Complete customers may also choose a **"Freedom Collection"** option, highly discounted access to all Elsevier journals available electronically.

The **Limited** option (sometimes referred to as "Standard") is identical in nature to a print subscription, the license terms being generally for one year only, with the library customer selecting each journal individually for access through ScienceDirect® from the Elsevier journals to which they currently subscribe. The Limited customer also has access to the immediately prior four years of the issues for the selected journals, but this content may not "build up" if the one-year contracts are not renewed. Full ScienceDirect® functionality is included, meaning the ability of users to conduct full searches of the licensed content through a variety of search queries, browse electronic tables of content, and link from a cross-reference to full article. Electronic access fee is an additional 25% of the prior print expenditure for the selected journals (including multiple subscriptions). Customers can also select electronic-only access on an ad-hoc basis (choosing some titles and not others), generally for a 10% discount on the print subscription fee relevant for the "e-only" journals and an access fee (both calculated off the base print price). Complete customers choosing the "e-only" option can also obtain the "E-Choice" variation by which they can purchase additional print copies of journals on an ad-hoc basis at a 75% discount. As is true of all "core" ScienceDirect® licenses, the Limited option provides for continued archival access to material subscribed to after the termination or expiration of the license. Finally, customers can also access articles from journals not subscribed to on a "**transactional**" or "pay per view" basis for a fee of $30 per article. The Limited option was originally developed for smaller customers in mind, but many larger institutions, especially in the USA, have chosen this option, preferring the greater flexibility it offers.

The licensed content included in the **Complete** option is based on the customer's current subscriptions (typically in the print context) with the possibility for substitution of one journal for another for collection development needs. Under the Complete option, the standard electronic access fee is currently set at 12.5% of the print subscription fee. Customers can also select electronic-only access generally for a 10% discount (as noted above) on the relevant print subscription fee and an access fee (both calculated off the base print price) Complete licenses are typically multi-year contracts and include customer-protective price-increase caps, and a discounted "pay per view" fee of $22 per article. The content accessed will include the four years

of issues prior to the beginning contract year, which will continue to build under the Complete option (unlike the Limited option), because they are multi-year licenses.

In addition to those titles subscribed to under the Complete option, Complete customers can as noted above select the **Freedom** option to obtain access to all other Elsevier non-subscribed journal content at heavily discounted rates (2.5% of print subscription rate for additional journals for small institutions; 5% for mid-sized institutions; 7.5% for large institutions). Archival rights however are not provided for non-subscribed titles.

At the beginning of 2006, Elsevier launched **e-Select**, designed for customers with small research collections. The programme offers electronic access to any of 1300+ Elsevier journals and is based on ad-hoc title by title purchases paid for by credit card. Access to the content is via username/password and goes back to 1995. No archival rights are included.

ScienceDirect® customers also have options to add specialized subject collections, selected Back-files (Elsevier is now finishing its scanning of all our old print journal issues to make our entire archive available), database products (e.g. EMBASE) and specialized reference works. Availability and relevance of some of these options will depend on whether the customer has selected the Limited, Complete or Freedom option. For example, Limited customers are not offered, and Freedom customers would not need, the specialized subject collections. Special introductory licenses have also been introduced for small institutions or companies who were not previously subscribers (for example the e-Select programme identified above).

Additionally, in 2003, Elsevier decided to open up the ScienceDirect platform to any user, even those not affiliated with a licensed institution, for **"pay per view"** transactions using credit card payments. Thus, any user can access the "sciencedirect.com" site, conduct a search of relevant journal content, and obtain a download of articles the user selects. The fee for these non-affiliated or general users is $30 for 2005.

Research institutions have been working collectively in consortia since the beginning of electronic licensing, and some of the earliest examples were the NESLI (National Electronic site License Initiative) program in the UK and the Bibsam consortium covering all universities in Sweden. Consortia take many different forms. NESLI is an example of a central negotiator, but all the 180 institutions involved entered into licenses separately. Bibsam is an example of a consortium with centralised funding and negotiation and purchase authority for the Swedish universities. Some consortia have formed which include private as well as public institutions, and some have formed across national boundaries. Consortia can thus be either highly centralised and coordinated units or looser confederations with certain model terms agreed but many options to be filled in by the individual institutions.

A general feature of consortia arrangements is access by all participating members to a selected group of journal titles subscribed to by the members collectively (sometimes referred to as "cross-access", now referred to by Elsevier as the "**Unique Title List**"). These arrangements generally increased usage and access throughout the entire group, and provided significant benefits to those institutional members who previously had smaller collections of journals. In recent years library customers have requested that consortia arrangements better balance payment obligations between institutions with a larger number of subscribed titles and institutions that had historically smaller collections.

Elsevier is not alone in offering a variety of choices and options in electronic licensing for customers, and publishers such as Wiley, Blackwell, Taylor and Francis, the American Physical Society and the American Institute for Physics, the American Physiological Society and the IEEE also offer various options, including the selection of journals on a title-by-title basis. Indeed many of the presentations made by publishers in 2004 to the ICOLC (International Consortium of Library Consortia) meeting noted in the Study (footnote 59) detailed such alternatives.

There are many hundreds of research institutions in the EU that have significant research collections or have access to such collections as a result of their participation in consortia arrangements. The majority of these institutions have access to virtually all of Elsevier content (the Freedom Collection option). This is significantly different from choices made for example in the USA, where only around 25% of the largest institutions have chosen the Freedom Collection option, and as noted reflects the higher degree of organisation and variety of approaches through consortia arrangements in Europe. Smaller institutions in the EU that participate in consortia arrangements see particularly significant benefits through such participation. However it is important to note that many major research institutions in the EU have selected print only (34 major institutions) or the Limited collection option (25 major institutions). It should be further noted that there are many hundreds of European institutions with small research collections that subscribe to print journals only that are not included in these calculations.

Although Elsevier and other publishers have offered significant incentives for customers to transition to purely electronic access, the number of library customers choosing an “e-only” model is still a minority (although a significantly growing minority now at something like 30%), and most of the total value of library expenditures is still attributed to print subscriptions. New pricing options and alternatives are being considered by all stakeholders, and Elsevier has begun to have discussions with library customers about the possibility of moving to a usage-based or user population based model, similar to database and software license models. However it is not clear whether these models will be widely accepted, and the likelihood is that most of the current Elsevier options will continue to be offered for the immediate future.

REFERENCES

[i] The Study suggests the core science publishing market to be between USD 7 and 11 billion. It is not clear what is included in these estimates but does represent much more than the market for scholarly journals. A very broad measure for scholarly journals market is around USD 6 billion (based on Simba data commissioned by Elsevier.) Global R&D spending is at least USD 638 billion as noted in the study for OECD R&D

[ii] Libraries that had relatively large collections of Elsevier journals in 1999 (334 titles on average) now have access to over 3 times as many journals via ScienceDirect® (1,221 on average). EU libraries that had relatively small collections of Elsevier journals in 1999 (106 titles or less) now have access to over 10 times as many journals via ScienceDirect®

[iii] For HINARI see http://www.who.int/hinari/about/en/ ; For AGORA see: http://www.aginternetwork.org/en/

[iv] *Journals and Scientific Productivity: a case study in immunology and microbiology,* by Rowlands and Olivieri, May 2006, www.publishingresearch.org.uk

[v] Ian Rowlands, Dave Nicholas and Paul Huntingdon "Scholarly Communication in the Digital Environment: What Do Authors Want?" Centre for Information Behaviour and the Evaluation of Research, department of Information Science, City University (now at UCL), 18 March 2004, see http://www.ucl.ac.uk/ciber/ciber.php

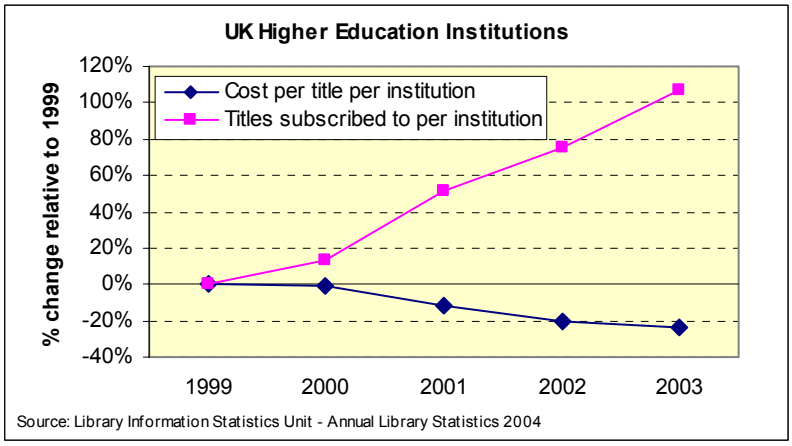
[vi] The UK Government noted that it "is not aware of any evidence of a significant problem in meeting the public's needs in respect of access to journals through public libraries. There are a number of ways public libraries can help members of the public gain access to journals." House of Commons Science and Technology Committee Responses to the Committee's Tenth Report, Session 2003–04, Scientific Publications: Free for all? Fourteenth Report of Session 2003–04: *Appendix 1 – Response from the Government*, p.15

[vii] Included in section 1.2 of the academic licence. Note that the Elsevier sample licence is available online at info.sciencedirect.com/samplelicense. Note also that some libraries elect not to allow public walk-in use of any of its information resources.

[viii] Outsell I-Market Hot Topics, vol 1, May 6, 2005: "2001 vs 2005, Research study reveals dramatic changes among information consumers"

[ix] Original data at www.dlib.org/dlib/october03/king/10king.html shows the average number of articles read by scientists was 150 in 1977 and 216 in 2000-2003. Cited by Carol Tenopir in presentation at web.utk.edu/~tenopir Discovering the Magic: Faculty and Student Use of Electronic Journals "Scientists appear to be reading from more journals—at least one article per year from approximately 23 journals, up from 13 in the late 1970s and 18 in the mid 1990s".

[x] Based on data reported in: LISU Annual Library Statistics 2004: http://www.lboro.ac.uk/departments/ls/lisu/pages/publications/als04.html



[xi] The Study, p. 16

[xii] HHI is Herfindahl-Herschmann Index, a universal measure of concentration used by competition authorities

[xiii] See pp.12 and 88 of the Study

[xiv] See p.12 of the Study, Recommendation B1

[xv] See p.64 of the Study

[xvi] Annual price comparison studies by Elsevier are based on published price lists. In the most recent study (2005-2006), Elsevier had the lowest percentage increase of all 15 commercial publishers included in the survey. Major commercial publishers were those that published 50 or more journals. The 14 commercial publishers which had percentage increases greater than Elsevier's represent 4,514 journals in total.

[xvii] Micra working paper no 2, May 2005 http://www.micradc.com/news/publications/paper2.html (submitted to American Economic Review).

[xviii] NIH Author Postings, A study to assess understanding of and compliance with NIH public access policy, GfK NOP and Kindle Research on behalf of the Publishing Research Consortium, Feb 2006, http://www.publishingresearch.org.uk/

[xix] The Study, p. 62

[xx] This does not include potential costs to control article versions or to combat the threat of plagiarism; the maintenance of a universally high quality standard would potentially require a significantly higher investment. Findings are based on external and Elsevier's internal research of IRs, interviews with managers of 6 leading university IRs, conference presentations, journal articles and IR proposals. Our analysis, based on this research, estimates the operating cost of IRs to be £100k per year, 90% of which is spent on human resources (approx. 2.5 Full Time Equivalents (FTEs) per year, with 30% overhead). These FTEs include the roles of advocacy/solicitation (1 FTE), IT customization and maintenance (0.75 FTEs), and quality assurance and meta data coding (0.75 FTEs)). Ongoing cost estimates per IR vary from £40k (JISC; http://www.jisc.ac.uk/issue_qaopen.html) to £160k (MIT estimate $285k converted at £1 = $0.56; Barton, M.R. & Walker, J.H. (2002). MIT Libraries' DSpace Business Plan Project: Final Report to the Andrew W. Mellon Foundation, p. 33. Available at: <http://libraries.mit.edu/dspace-mit/mit/mellon.pdf>). Using the mid range of around £100k, the total annual cost to UK HEIs is therefore 165 x £100k = £16.5 million. Of this an estimated 80% (£13.2 million) will be associated with research papers. IRs cost

approximately £100k per year to run; a cost frequently not recognized by IR advocates "We haven't done a cost analysis of our IR, but costs are probably higher than most people think. For instance, we have hidden the running costs within our existing budget by transferring staff from our under-utilized inter-library loans department" Library Administrator, medium sized UK university

[xxi] Publisher and Library/Learning Solutions (PALS) Pathfinder Research on Web-based Repositories, Final Report MarkWare Consulting Ltd. January 2004, p.24. Long term costs associated with preservation will include ongoing hardware costs, maintenance and tape backup, additional hardware storage to support new content (especially if authors are mandated to archive instrument or simulation data reported in articles), IR software development costs, and faculty time to enter and maintain article metadata Expected yet unaccounted for ongoing costs discussed in interviews with 6 leading academic libraries operating IRs. Mackenzie Smith, MIT Libraries associate director for technology and DSpace project director, believes new professionals will need to run IRs. She states "We will have to create a new profession of 'data curator'--a combination of scientist (or other data specialist), statistician, and information expert."

[xxii] ALPSP survey of librarians on factors in journal cancellation, Mark Ware Consulting Ltd, http://www.alpsp.org/publications/pub12.htm

[xxiii] The Study, p.64-65

[xxiv] "The Government has not decided against the author-pays model, but does not want to force a premature transition to a different system. To strongly endorse or reject the author-pays approach would not be in the interests of allowing the market itself to evolve to meet the needs of authors and the wide academic community. The action the Government has decided on is to facilitate a level playing field." House of Commons Science and Technology Committee, *Responses to the Committee's Tenth Report, Session 2003-04, Scientific Publications: Free for All?: Responses to the Committee's 14th Report of Session 2003-04.* Third Special Report of Session 2004-05 HC 249. Published on 1 February 2005 by authority of House of Commons, London. The Stationary Office Limited.

[xxv] See also The Study, p.13. In recommendation C2 it notes the need for further investigation of economic analysis of alternative forms of dissemination: "for example the feasibility/desirability of alternative publishing business models (pay per download, author-pay systems, hybrid systems.)"

[xxvi] In Reed Elsevier submission to DG research study on scientific publishing market in Europe, figure 11, p 45, January 2005

[xxvii] ALPSP report on "The facts about open access", Kaufmann Wills Group ,LLC, Oct 2005. http://www.alpsp.org/publications/pub11.htm

[xxviii] Of course, most customers actually pay less than this average in the print plus electronic environment.