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Reed Elsevier: A Short History of Two Days in July (and Why Investors Should Care)

Ticker	Rating	CUR	6 Sep 2012 Closing Price	Target Price	TTM Rel. Perf.	EPS 2011A	EPS 2012E	EPS 2013E	P/E 2011A	P/E 2012E	P/E 2013E	Yield
REL.LN	U	GBp	604.00	400.00	10.1%	46.70	47.59	48.56	12.9	12.7	12.4	4.0%
REN.NA	U	EUR	10.65	7.00	19.4%	0.83	0.90	0.92	12.8	11.9	11.6	4.3%
MSDLE15			1081.05			96.74	95.15	107.06	11.2	11.4	10.1	3.9%

O – Outperform, M – Market-Perform, U – Underperform, N – Not Rated

Highlights

This document reviews the potential impact on Elsevier of a transformation of the STM publishing model, triggered by the rising tide of Open Access mandates. Readers who are familiar with the basics of OA may want to go to page 8, because the preceding pages represent an introduction to OA for readers who are new to the issue. Investors who wish to keep themselves abreast of developments on OA may consider subscribing to the SPARC Open Access Newsletter written by Peter Suber (peter.suber@gmail.com). The latest issue (9/2012) contains an excellent and in depth review of the events outlined later in this call, and we used Suber's document as a base to organize pages 8 and 9 of this call.

- **The mid-July announcements of changes to UK Open Access (OA) policies, and the subsequent announcement of an EC OA recommendation, introduce major changes to the STM journal publishing landscape.**
  - Investors have largely shrugged off, in recent years, the threat posed by OA to the business model of Elsevier. We were, to a great extent, guilty of similarly dismissing the issue, and focused most of our concerns on the challenges posed by academic library budgets. We still believe the budget issue is very significant and will increasingly affect Elsevier; the revival of OA, however, further clouds the outlook for subscription publishers.
  - On the 16th July, three concurrent announcements (Research Councils UK – RCUK; Finch Group and Higher Education Funding Council for England – HEFCE) deeply modified the outlook for OA in the UK. Taken together, these announcements establish a framework for introducing OA to the UK over a short period of time.
  - On the 17th July, the European Commission (EC) published its own set of documents on OA, which further raise the possibility that OA will become a prevalent mode of dissemination of scientific research, and widened the set of potential OA models
- **After an initial reaction, investors largely shrugged off the issue.** The markets initially responded negatively to the EC announcements (while the UK announcements form the day before were perceived as less disruptive to Elsevier and went largely ignored). On the day of the UK announcements, Reed Elsevier's UK and Dutch stocks barely moved, but on the 18th July, the day after the EC announcements, they lost -1.6% and -2.5% (in absolute terms) and -2.7% and -3.7% (in relative terms), respectively. The impact of the news, however, was seemingly quickly overshadowed by the Interim Results, published on the 26th July. In fact, since the 1st July, the UK and Dutch stocks have outperformed the MSCI Europe by 13.7% and 13.6%, respectively.

European Media

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- **In reality, we think the risk posed to the Elsevier business model is substantial.** We believe investors are underestimating the disruption that both the EC and even the UK policies could pose to the business model of Elsevier. Investors have understandably reacted negatively to the EC announcements, both because they seemed to provide a landslide momentum, and because publishers have vigorously opposed public dissemination mandates, and particularly so when they have demanded short embargo periods. In reality, however, we increasingly think that both the EC recommendations and the UK policy (if extended to other parts of the world) could prove highly disruptive to Elsevier over time. We have developed a number of scenarios for the impact of a global adoption of policies like the UK one, and estimate that it could drive the profitability of the journal business of Elsevier down by as much as 60%.
- **The potential impact on the profitability of Reed Elsevier should not be underestimated.** We estimate that STM journals represent only 17% of Reed Elsevier group revenues, but they may account for as much as 25% of the group operating profit. In the past we have argued that the budget constraints affecting academic libraries would impede returning to organic growth in the 5%+ region, as the journals achieved before the onset of the recession of 2008. Our model is still based on the assumption that OA would not happen, and that investors would see the impact of this budget crisis primarily through the progressive decline of the organic revenue growth rate below consensus expectations. A collapse of the profitability of Elsevier would be catastrophic for Reed Elsevier. Looking at our 2015 forecasts, a decline in the profitability of the Elsevier journals (our best case) following a global shift to Gold OA would reduce group adjusted operating profit by c. -14%, while the collapse to a negative profitability (our base case) would shrink it by c.-27%.

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Investment Conclusion

Reed Elsevier

The key historical driver to Reed Elsevier's performance has been LexisNexis, the legal and risk management division, which in recent years contributed over 40% of operating profit growth. Investors have been increasingly concerned since the beginning of 2009 about the performance of the core US legal research business and of some print businesses within LexisNexis as a result of the poor economy; in addition, 2010 results confirmed that growth of Elsevier (the STM publishing division) had slowed because of pressure on academic budgets a pattern that has continued in 2011. In addition to the cyclical issues outlined earlier, we are increasingly concerned about longer term structural issues in US legal research and about a prolonged decline in funding for academic libraries which could trigger lower spending on STM journals. Our analysis suggests that a progressive break-up of the company could yield a 20 to 30% increase to the value of the company, but we think that management is unlikely to pursue more than minor adjustments to the portfolio (such as continuing the divestiture of RBI's assets and selling the Exhibitions business) in the next year or two.

We rate Reed Elsevier Underperform with target prices of £4.00/€7.00 for its UK and Dutch stocks, respectively.

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Details

The mid-July announcements of changes to UK Open Access (OA) policies and of an EC OA recommendation introduce major changes to the STM journal publishing landscape

Background reading – a brief history of OA

Investors have largely shrugged off, in recent years, the threat posed by OA to the business model of Elsevier. We were, to a great extent, guilty of similarly dismissing the issue, and focused most of our concerns on the challenges posed by academic library budgets. We still believe the budget issue is very significant and will increasingly affect Elsevier; the revival of OA, however, further clouds the outlook for subscription publishers.

Open Access (OA) is – in its simplest form – the free availability of academic research and scholarly articles (for practical purposes online, because of the costs of printing and shipping physical copies) after the completion of peer-review and in perpetuity. While the idea has been around for a long time, it gained strength with the advent of the World Wide Web, which provided the perfect platform for free distribution of content (since the marginal cost of a download is infinitesimal). In 2001, the modern Open Access movement was re-energized by the publication of an Open Letter supported by the Public Library of Science (PLoS), even if the proposal tried to strike a compromise between free circulation of research and the economic interests of publishers (**Exhibit 1**). OA was viewed, from the very beginning, as a way to tackle several issues: the lack of availability of leading edge scientific research both in developing country and among start ups and small companies unable to pay the high prices of subscription to journals; the belief that for-profit publishing of academic research is an unacceptable burden on academic institutions, since it is effectively a "tax" on the dissemination of research, and that universities and other research institutions have paid for it in the form of salaries and funding for the research itself. Subsequent declarations, like the 2003 Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities, offered a lot less comfort to for-profit publishers (**Exhibit 2**).

Exhibit 1
The Open Letter circulated in 2001 by the Public Library of Science (PLoS) advocated freely accessible and searchable research but offered an olive branch to the publisher

We support the establishment of an online public library that would provide the full contents of the published record of research and scholarly discourse in medicine and the life sciences in a freely accessible, fully searchable, interlinked form. Establishment of this public library would vastly increase the accessibility and utility of the scientific literature, enhance scientific productivity, and catalyze integration of the disparate communities of knowledge and ideas in biomedical sciences.

We recognize that the publishers of our scientific journals have a legitimate right to a fair financial return for their role in scientific communication. We believe, however, that the permanent, archival record of scientific research and ideas should neither be owned nor controlled by publishers, but should belong to the public and should be freely available through an international online public library.

To encourage the publishers of our journals to support this endeavor, we pledge that, beginning in September 2001, we will publish in, edit or review for, and personally subscribe to only those scholarly and scientific journals that have agreed to grant unrestricted free distribution rights to any and all original research reports that they have published, through PubMed Central and similar online public resources, within 6 months of their initial publication date.

Source: PLoS

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OA was viewed, from the very beginning, as a way to tackle several issues: the lack of access to leading edge scientific research both in developing country and among start-ups and small companies unable to pay the high prices of subscription to journals; the belief that restriction to information leads to lower readership of research among core constituencies (i.e. other scientists), and – last but not least – the belief that for-profit publishing of academic research is an unacceptable burden on academic institutions, since it is effectively a "tax" on the dissemination of research.

In a nutshell, this argues that universities and other research institutions (and, ultimately, the tax payer) have paid for research in the form of salaries and funding for the research itself, and should not have to pay (or at least should not pay much) to access it when published. In reality, there is some confusion in the terminology: OA and subscription journals can both be for-profit or not for-profit; in reality, what OA activists complained about was the high cost of subscriptions and the high operating margins of the larger for-profit publishers (and Elsevier in particular). Subsequent declarations, like the 2003 Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities, offered a lot less comfort to for-profit publishers (**Exhibit 2**).

Exhibit 2
The Berlin Declaration on Open Access to knowledge in the Sciences and Humanities offered less solace to for-profit publishers

Preface

The Internet has fundamentally changed the practical and economic realities of distributing scientific knowledge and cultural heritage. For the first time ever, the Internet now offers the chance to constitute a global and interactive representation of human knowledge, including cultural heritage and the guarantee of worldwide access.

We, the undersigned, feel obliged to address the challenges of the Internet as an emerging functional medium for distributing knowledge. Obviously, these developments will be able to significantly modify the nature of scientific publishing as well as the existing system of quality assurance.

In accordance with the spirit of the Declaration of the Budapest Open Access Initiative, the ECHO Charter and the Bethesda Statement on Open Access Publishing, we have drafted the Berlin Declaration to promote the Internet as a functional instrument for a global scientific knowledge base and human reflection and to specify measures which research policy makers, research institutions, funding agencies, libraries, archives and museums need to consider.

Goals

Our mission of disseminating knowledge is only half complete if the information is not made widely and readily available to society. New possibilities of knowledge dissemination not only through the classical form but also and increasingly through the open access paradigm via the Internet have to be supported. We define open access as a comprehensive source of human knowledge and cultural heritage that has been approved by the scientific community.

In order to realize the vision of a global and accessible representation of knowledge, the future Web has to be sustainable, interactive, and transparent. Content and software tools must be openly accessible and compatible.

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Definition of an Open Access Contribution

Establishing open access as a worthwhile procedure ideally requires the active commitment of each and every individual producer of scientific knowledge and holder of cultural heritage. Open access contributions include original scientific research results, raw data and metadata, source materials, digital representations of pictorial and graphical materials and scholarly multimedia material.

Open access contributions must satisfy two conditions:

The author(s) and right holder(s) of such contributions grant(s) to all users a free, irrevocable, worldwide, right of access to, and a license to copy, use, distribute, transmit and display the work publicly and to make and distribute derivative works, in any digital medium for any responsible purpose, subject to proper attribution of authorship (community standards, will continue to provide the mechanism for enforcement of proper attribution and responsible use of the published work, as they do now), as well as the right to make small numbers of printed copies for their personal use.

A complete version of the work and all supplemental materials, including a copy of the permission as stated above, in an appropriate standard electronic format is deposited (and thus published) in at least one online repository using suitable technical standards (such as the Open Archive definitions) that is supported and maintained by an academic institution, scholarly society, government agency, or other well-established organization that seeks to enable open access, unrestricted distribution, inter operability, and long-term archiving.

Supporting the Transition to the Electronic Open Access Paradigm

Our organizations are interested in the further promotion of the new open access paradigm to gain the most benefit for science and society. Therefore, we intend to make progress by

- encouraging our researchers/grant recipients to publish their work according to the principles of the open access paradigm.

- encouraging the holders of cultural heritage to support open access by providing their resources on the Internet.

- developing means and ways to evaluate open access contributions and online-journals in order to maintain the standards of quality assurance and good scientific practice.

- advocating that open access publication be recognized in promotion and tenure evaluation.

- advocating the intrinsic merit of contributions to an open access infrastructure by software tool development, content provision, metadata creation, or the publication of individual articles.

We realize that the process of moving to open access changes the dissemination of knowledge with respect to legal and financial aspects. Our organizations aim to find solutions that support further development of the existing legal and financial frameworks in order to facilitate optimal use and access.

Source: Max Planck Gesellschaft

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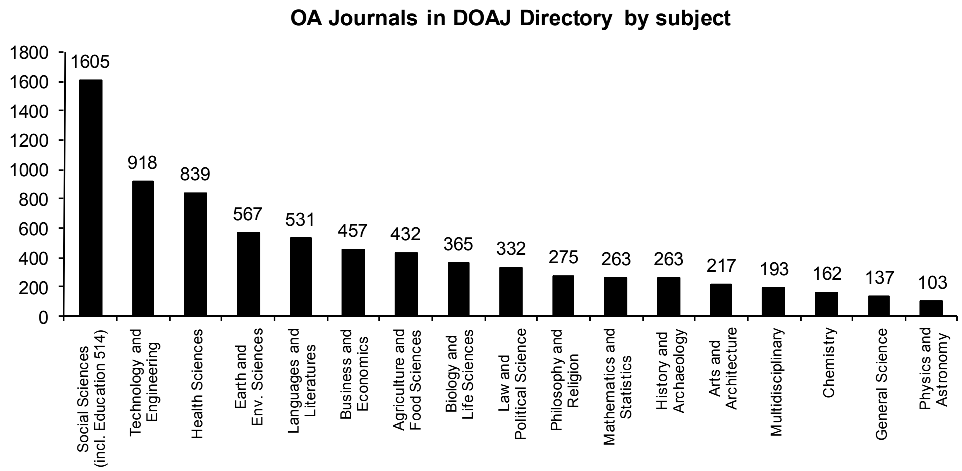
Since then, a significant number of academics have attempted to estimate the actual relevance of OA both in terms of articles published and of impact on the dissemination of academic research. Elsevier, in 2004, indicates that – according to its estimates – about 4% of all STM articles are now published under OA schemes; supporters of Open Access claim much higher penetration rates (up to 15-20% of all research published). DOAJ (Directory of Open Access Journals) lists over 7,500 OA academic journals; more than 45% of them are in STM-related subjects (**Exhibit 3**).

Exhibit 3
About 45% of Open Access journals are in STM-related subjects



Source: DOAJ (Directory of Open Access Journals), Bernstein analysis

While this number may appear significant, Elsevier alone publishes ca. 1,950 journals (1,250 in Science & Technology; 700 in Health Sciences). Most important, the OA journals have barely dented the market position of traditional subscription publishers. We think that OA failed for one fundamental reason: self interest. Academics may, in principle, support the concept of Open Access. But when it comes to actually submitting their own research for publication, academics seem to put the prestige of the publication before the economic model (once, conversing with a Harvard professor who is a leading thinker on dissemination, he pointed out that his peers would perhaps consider publishing on a small percentage of OA journals – perhaps 400-500 titles).

We actually believe this behaviour is a very rational legacy of traditional print distribution of journals: when universities had no objective way to appraise the quality of research (and even inventorying citations was very difficult and time-consuming), the prestige of the publication represented a valuable proxy for the quality of the articles published. Since key academic staff processes (hiring, compensation, advancement, tenure) are largely driven by publishing, it is easy to see why publishing in prestigious journal would be the most rational course of action for academics, regardless of the economic model of the journals.

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For practical purposes, investors concluded several years ago that Open Access was not a significant issue for Elsevier. In retrospect, this optimistic view was always excessive: for years now, in the US, OA activists have been trying to win a public dissemination mandate akin to the one adopted by the NIH either through legislation in Congress or through an Executive Order[1]. More recently, Elsevier's questionable decision to support the RWA rekindled the debate around its business practices, triggering a boycott of its journals which gathered relatively few participants (around 12,600 at this point – please see *http://thecostofknowledge.com/* for updates on the front page of the boycott) but won considerable visibility in the press[2].

The UK announcements

On the 16th July, three concurrent announcements (Research Councils UK – RCUK; Finch Group and Higher Education Funding Council for England – HEFCE) deeply modified the outlook for OA in the UK. Taken together, these announcements establish a framework for introducing OA to the UK over a short period of time.

The first report was published by Research Councils UK[3]. As a reminder, RCUK is a major contributor to funding scientific research (it spends about £3 billion/year through its seven member Councils). The key provision of the RCUK report is that *"The new policy, which will apply to all qualifying publications being submitted for publication from 1 April 2013, states that peer reviewed research papers which result from research that is wholly or partially funded by the Research Council must be published in journals which are compliant with Research Council policy on Open Access, and must include details of the funding that supported the research, and a statement on how the underlying research materials such as data, samples or models can be accessed.*

Criteria which journals must fulfil to be compliant with the Research Councils' Open Access policy are detailed within the policy, but include offering a "pay to publish" option or allowing deposit in a subject or institutional repository after a mandated maximum embargo period. In addition, the policy mandates use of the Creative Commons 'Attribution' license (CC-BY), when an Article Processing Charge (APC) is levied. The CC-BY licence allows others to modify, build upon and/or distribute the licensed work (including for commercial purposes) as long as the original author is credited"

The Finch report[4] did not go as far, recommending that papers be published in OA journals (or in hybrid journals which are still made available on subscription, but which allow OA of individual articles, assuming that a publication charge is paid in lieu of keeping the article behind the subscription pay wall). This was a clear choice in favour of the so called "Gold OA" model (as opposed to "Green OA", in which articles are posted in on line repositories after their peer review is completed – with a number of possible variations around whether the articles are still published in subscription journals and whether access to the OA paper is restricted during a so-called "embargo period").

[1] For more details, please see our call *Reed Elsevier: How the Obama Administration May Affect the Future of Science, Technical & Medical (STM) Publishing*, published on 11th March, 2010.

[2] For more details, please see our calls *Occupy Elsevier*, published on 6th February, 2012, and *Reed Elsevier: The Other 99% Wins One - Elsevier Withdraws Support for the RWA*, published on 28th February, 2012.

[3] *http://www.rcuk.ac.uk/media/news/2012news/Pages/120716.aspx*
[4] *http://www.researchinfonet.org/wp-content/uploads/2012/06/Finch-Group-report-FINAL-VERSION.pdf*

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Crucially, the Finch Report also took a very prudent approach towards what kind of license to recommend: *"But for subscription-based publishers, re-use rights may pose problems. Any requirement for them to use a Creative Commons 'CC-BY' licence, for example, would allow users to modify, build upon and distribute the licensed work, for commercial as well as non-commercial purposes, so long as the original authors were credited. Publishers – and some researchers - are especially concerned about allowing commercial re-use. Medical journal publishers, who derive a considerable part of their revenues from the sale of reprints to pharmaceutical companies, could face significant loss of income. But more generally, commercial re-use would allow third parties to harvest published content from repositories and present them on new platforms that would compete with the original publisher".* We believe the discrepancy between the firm requirement of the RCUK policy and the accommodating language of the Finch report is very relevant, because we expect a new controversy to brew in the years to come over text mining and the software and services associated with it. Subscription publishers are trying to retain all the rights related to this activity, while researchers, understandably, want to have freedom to use the tools of their choice for several reasons (i.e. uniformity of algorithms, cost). For more information on this issue, please see our call *Reed Elsevier: Is Elsevier Heading for a Political Train-Wreck?*, published on 20th April, 2012.

The decision to support Gold OA (and the sceptical stance towards the CC-BY license) was viewed by several industry observers as a favour to the subscription publishers (in fact, Reed Elsevier declared itself supportive of the Finch Report conclusions). For example, Professor Derek Law, Chairman of the Trustees of the Electronic Publishing Trust for Development published a response[5] which stated *" While the overall adoption of the international OA movement as the new research distribution mechanism is greatly to be welcomed and will encourage many remaining doubters, it is profoundly disappointing that Green OA has been designated as merely a fringe resource for all manner of writings. It is difficult not to sound unprofessional and populist when describing the huge imbalance between the importance of sharing essential research and that of retaining the profits of the publishing service industry, but publishing exists to support research, not the other way round".* Similar or even more forceful comments came from several other sources.

In spite of the apparent differences, however, the RCUK policy and the Finch report are not widely dissimilar. While there was some initial confusion on the degree and relevance of the discrepancies, the most current interpretations suggest that these differences are indeed minor. For example, the Publishers Association released a very detailed and useful analysis of the two statements, concluding that they are broadly aligned[6]

Finally, still on the same day, the HEFCE (which is also a significant funding body, budgeting to disburse £1.558 billion in 2012-13 to support research), stated – somewhat vaguely – that it would develop policies to make research it funds *"as widely accessible as possible"* and supported the Finch report guidelines[7].

[5] Please see the bottom of this page *http://poynder.blogspot.co.uk/2012/07/the-finch-report-and-its-implications.html*

[6] *http://www.publishers.org.uk/index.php?option=com_content&view=article&id=2299:finch-willetts-rcuk-green-oa-and-embargoes&catid=503:pa-press-releases-and-comments&Itemid=1618*

[7] *http://www.hefce.ac.uk/news/newsarchive/2012/statementonimplementingopenaccess/*

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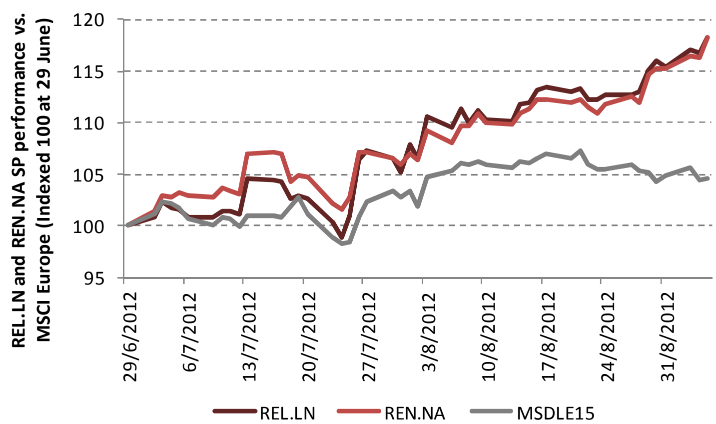
The EC announcements

On the 17th July, the European Commission (EC) published its own set of documents on OA, which further raise the possibility that OA will become a prevalent mode of dissemination of scientific research, and widened the set of potential OA models[8] (the EC, in fact, explicitly indicated it also supports Green OA). In its recommendations, the EC indicated it would like to see OA mandates from all member states for publicly-funded research, with papers made available to the public immediately or no later than six months after publication. Of course, individual member states will have to define their own policies, and it is too early to tell whether they are more likely to purse the EC or the UK approach.

After an initial reaction, investors largely shrugged off the issue

The markets initially responded negatively to the EC announcements (while the UK announcements form the day before were perceived as less disruptive to Elsevier and went largely ignored). On the day of the UK announcements, Reed Elsevier's UK and Dutch stocks barely moved, but on the 18th July, the day after the EC announcements, they lost -1.6% and -2.5% (in absolute terms) and -2.7% and -3.7% (in relative terms), respectively. The impact of these news, however, was seemingly quickly overshadowed by the Interim Results, published on the 26th July. In fact, since the 1st July, the UK and Dutch stocks have outperformed the MSCI Europe by 13.7% and 13.6%, respectively (**Exhibit 4**).

Exhibit 4
REL.LN and REN.NA absolute and relative performance (vs. MSCI Europe) between 1st July and 5th September 2012



Source: Factset (5th Sept, 2012), Bernstein analysis

[8] Please see http://ec.europa.eu/research/science-society/document_library/pdf_06/era-communication-partnership-excellence-growth_en.pdf, http://ec.europa.eu/research/science-society/document_library/pdf_06/era-communication-towards-better-access-to-scientific-information_en.pdf and http://ec.europa.eu/research/science-society/document_library/pdf_06/recommendation-access-and-preservation-scientific-information_en.pdf

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In reality, the risk posed to the Elsevier business model is substantial

Double dipping and other tasty practices

We believe investors are underestimating the disruption that both the EC and even the UK policies could pose to the business model of Elsevier. Investors have understandably reacted negatively to the EC announcements, both because they seemed to provide a landslide momentum, and because publishers have vigorously opposed public dissemination mandates, and particularly so when they have demanded short embargo periods. In reality, however, we increasingly think that both the EC recommendations and the UK policy (if extended to other parts of the world) could prove highly disruptive to Elsevier over time.

A couple of years ago we estimated that a public mandate imposed by the US Federal Government could put pressure on the contract renewal of as much as 10% of Elsevier revenues (for the details of the analysis, please see pages 9 to 15 of this call: *Reed Elsevier: How the Obama Administration May Affect the Future of Science, Technical & Medical (STM) Publishing*, published on 11th March, 2010). Since then, we have given further thought on what a public mandate (and even more so, a Gold OA model) could mean for Elsevier.

First of all, much depends on how widespread the changes are, as well as on the pace of adoption. At one extreme, if the UK is the only country to adopt an OA policy, publishers are probably set to benefit, although the impact would be marginal. We expect the vast majority of subscription publishers to accommodate the UK policies through the introduction (where it is not already available) of the so-called "hybrid" model. In this model, subscription journals accept to make individual articles available without a pay wall in exchange for receiving an Author Publication Charge (APC) and several publishers already offer routinely this option. The hybrid model has actually led to charges of the publishers "double-dipping" because they receive the APCs but do not refund the subscribers for the incremental revenues received from another source.

To be fair to the publishers, the number of articles published under this model is extremely low: Elsevier states it published 734 "sponsored articles" in 2010 and 1,014 in 2011 (we estimate that Elsevier published a total of ca. 315,000 articles in 2011, so sponsored OA articles represented 0.3% of their total volume)., making refunds impractical. The company, in response to accusations of "double-dipping", issued a document[9] in which it claims that *"Elsevier amends its journal list prices to account for each and every sponsored open access article. Our subscription customers are not charged for open access articles – we do not double dip"*. Of course the issue is not whether subscription customers (over 90% of journals is sold in some kind of bundle and virtually 100% are sold on subscriptions, as opposed to single copy) are made to pay. The question is whether Elsevier, which is now signing increasing numbers of multi-year (3 to 5) subscriptions without any knowledge of the future incidence of sponsored articles does or does refund in later years their customers for their actual incidence (we are still to meet an academic librarian who has received a refund). Again, at these levels of activity, the amounts of money are trivial.

The UK represents roughly 4 to 5% of the total articles published annually. Public funding may affect about 60 to 70% of them, meaning that 2 to 3% of the articles published annually may have to either go to OA journals or be published under the sponsored model, and we would expect Elsevier to see roughly similar numbers (or higher, since the average impact factor of UK articles is probably high and authors will want to see their articles in leading publications). It remains to be seen whether Elsevier will aggressively refund customers to compensate for the APCs it receives. If it manages not to, then possible benefits from the UK policy are easy to understand.

[9] http://www.elsevier.com/framework_authors/Sponsoredarticles/pdfs/Sponsored_Articles_2011.pdf

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The likelihood that Elsevier will have to refund APCs (or indeed transform its publications into OA journals) will rise substantially if the bulk of the EU (and in a particular Germany, France and, to a lesser extent, Italy) adopts similar policies. The EU accounted for 33% of articles in 2009 and, although is quickly losing share because of the fast rise of the BRICs, it probably still accounts for about 30% of the total output. Even adjusting for non-government funded research, the adoption across the EU of an OA policy would probably affect around 25% of published research, making it impossible to hide APCs and "double dip". In addition, if the US Federal Government was to adopt a similar stance, an additional 18% or so of the articles would be covered by OA policies. Finally, a growing number of non government institutions are moving in the same direction (for example, the Wellcome Trust in the UK, which intends to award an average of £800 million/year over the next five years, now also mandates OA dissemination).

Timelines for the adoption of these different policies are highly different and – in the case of the US – hypothetical. The RCUK policy states that it will apply to all papers submitted for publication from the 1st April 2013. The EC stated it is committed to see its policy start functioning in 2014. Even assuming a relatively slow take up of compliance, by 2015/16 compliance of the UK policies and several EU policies should be substantially high. In the US, where Congress has repeatedly failed to take action on legislation introduced over the years to expand public dissemination policies from the NIH alone to most of the research funded by the Federal Government, the Obama administration has laid much of the ground work for an Executive Order to achieve the same goals. In the absence of a draft policy, however, it is impossible to even begin discussing a timeframe for its implementation, and – should Romney win in November – the issuance of an Executive Order would probably be set back by years, and perhaps for his entire administration, in our view.

All in all, it is not inconceivable, however, that by the end of the decade and perhaps as soon as in the next four years most leading subscription publishers will be forced to adopt an OA model because one to two thirds of their articles will be covered by an OA policy, making subscriptions virtually irrelevant.

It is fair to note that Reed Elsevier would probably dispute this, and argue that coverage of OA mandates, compliance and timing are all uncertain. One year ago, however, Reed Elsevier would have probably argued that OA had won no government backing anywhere, and that therefore *any* OA mandates were likely to be imposed a decade away, if ever. The sudden acceleration in the past 12 months should make investors wary of excessively optimistic views on the future of subscription publishing.

Brave New World

In the past we could not understand why Reed Elsevier opposed OA so much. After all, why not just charge an adequate APC and do without the aggravation of antagonizing librarians and the academic community? We believe we made a major mistake: we treated all journals as equal, while they are not. **Exhibit 5** and **Exhibit 6** explain what we think is the real underlying issue for the industry (and for Elsevier) – a lot of the articles published are not very relevant. The two exhibits show the readership of articles in life sciences and chemistry, respectively, at 10 UK universities; the top 20-25% of journals account for 75 to 90% of the readership and the top 50% for about 95%. Conversations with academic librarians suggest they see similar data elsewhere. In other words, half of the articles which are published today are largely ignored by the scientific community, even if the libraries acquire (and pay) them.

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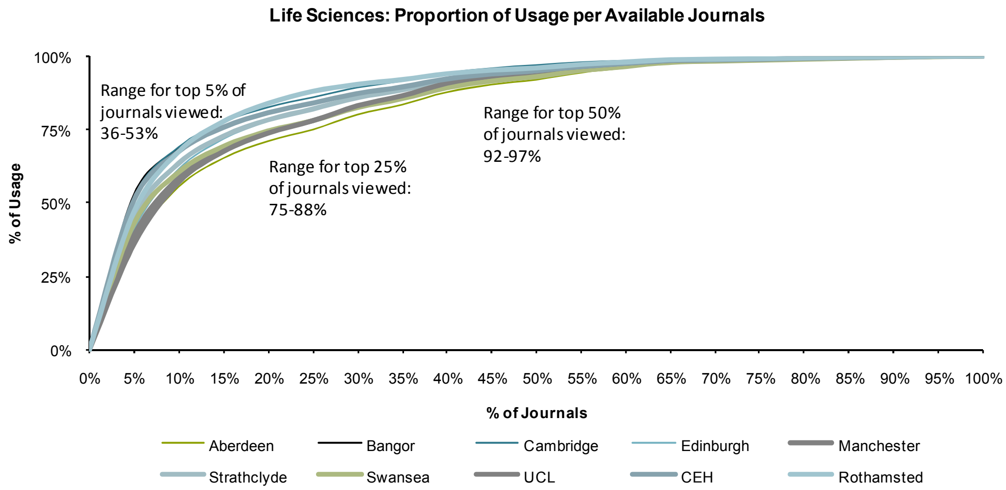
Exhibit 5

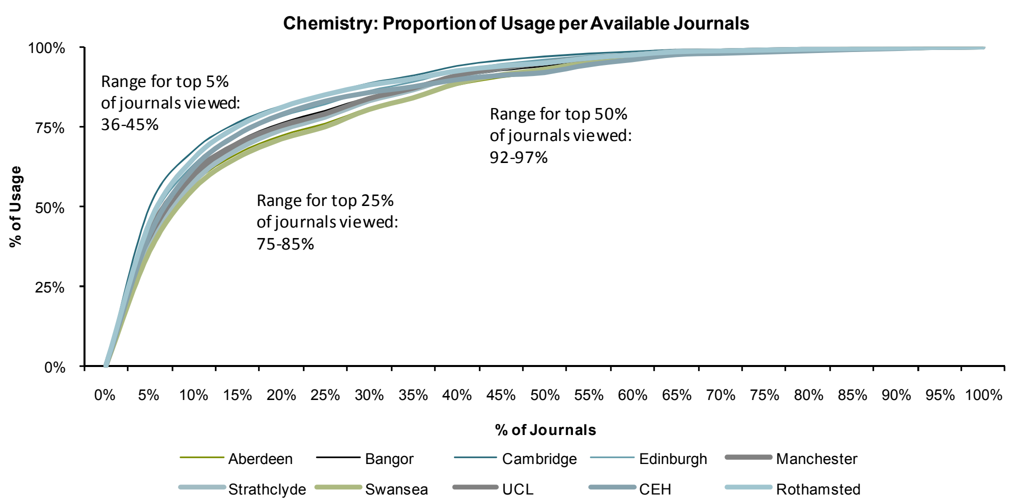
A low proportion of Life Science journals account for a high proportion of usage at a diverse range of universities in the UK…



Source: Research Information Network, Bernstein estimates and analysis

Exhibit 6

…it is a near identical story for Chemistry journals



Source: Research Information Network, Bernstein estimates and analysis

Does Elsevier do any better than this? Of course only the company itself, looking at internal data, can know the precise answer. There is, however, evidence that Elsevier is not significantly better off. New Mexico State University made available the readership data for two big deals it had discontinued, which included Elsevier (**Exhibit 7**). The curve looks very similar to that of the UK universities we saw earlier: 10% of journals from major publishers had been accessed at least once a week in the previous year, while more than two thirds had been accessed less than once a month.

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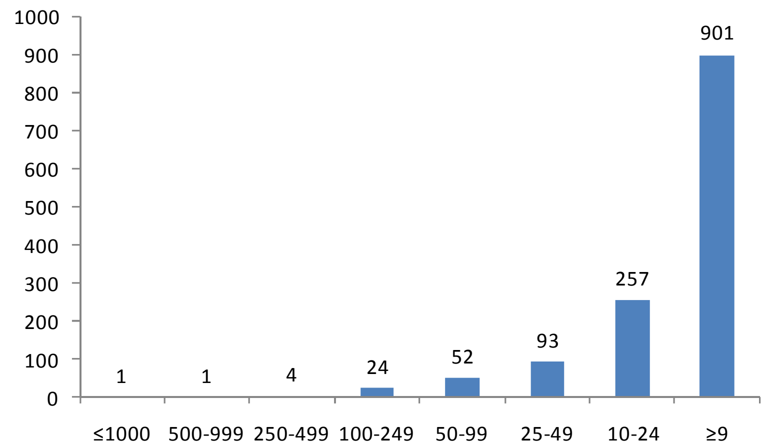
To be fair, low readership numbers may be a function of the number of faculty, researchers and doctoral candidates working in a specific discipline. But NMSU, when it went through a second round of titles cutting earlier in 2012 (which did not involve Elsevier titles, since they had been culled in 2010), involved the faculty to make sure it would not cancel titles of high value to small community. In its information release[10], the library noted that the faculty asked to protect only 5% of the low readership titles: *"In May 2012 the Library announced that it would be cancelling 276 journal titles to meet its target amount of $200,000. University faculty contested the cancellation of 14 of the 276 titles, noting the high research value of each. Due to the generosity of the University Administration, the Library has reduced its cancellation list to 261 titles for a total cancellation amount of $167,935. These 261 journal titles show low use (10 or fewer uses), or no use, or cost $100 or more per use".*

Exhibit 7

More than two thirds of the journals cancelled by NMSU at the end of 2010 were accessed once a month or less; less than 9% had been accessed once a week or more.



Source: NMSU Library, Bernstein analysis

So, can Elsevier charge enough APCs to make up for the risk of losing subscription revenues? We are very sceptical. Let's start with the facts. Elsevier states that its typical APC for sponsored articles is $3,000/article (equivalent to about £2,000/article). This number has had many observers marvel, since APCs of OA journals are much lower. Public Library of Science (PLoS), a major OA publisher, reportedly charges about £900/article, and an analysis published Solomon and Bjork found that the average APC is closer to £600/article[11].

So is Elsevier charging unreasonable amounts of money for its APCs? It would not appear so: Elsevier publishes about 316,000 articles each year: if all of them were funded through APCs, Elsevier would barely break even, assuming it currently earns a 40% operating profit (in fact, if one assumes its operating profits from journals are lower than 40%, then the company would be theoretically losing money when it publishes a sponsored article). Is Elsevier then grossly mismanaged on the costs side? It is probably true that Elsevier does not run itself on a shoestring like a start-up would, but we doubt that its productivity (the bulk of the costs for STM publishers are staff and staff-related) is one third of the average OA journal. Reality is that

[10] http://nmsu.libguides.com/budgetcuts
[11] http://www.openaccesspublishing.org/apc2/preprint.pdf

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Elsevier processes many more articles it publishes: its cost per article submitted is in the region of £700/article, much closer to what mid-tier OA publishers are charging (**Exhibits 8** to **9**).

Exhibit 8
Elsevier apparent costs are in the vicinity of £2,000/article published…

£ million	**2011**
Total Elsevier revenues	2058
Journals as % of total Elsevier	50%
Total Journals revenue	1029
Journals operating margin	40%
Journals costs	617
Articles published	316,000
Cost/article (£)	1,954

Source: Reed Elsevier annual reports and presentations, interviews, Bernstein estimates and analysis

Exhibit 9
…but in reality they are in the vicinity of £700/article submitted

£ million	**2011**
Total Elsevier revenues	2058
Journals as % of total Elsevier	50%
Total Journals revenue	1029
Journals operating margin	40%
Journals costs	617
Articles reviewed	850,000
Cost/article (£)	726

Source: Reed Elsevier annual reports and presentations, interviews, Bernstein estimates and analysis

This is, in fact, the real issue OA poses to Elsevier. Just to keep its revenues even (we are ignoring the cost difference between selling and processing subscriptions and selling and processing APCs, since it is not clear the difference is material), the company would have had to charge £3,200/article published in 2011, equivalent to $5,145/article, a 71% increase over the current APC of $3,000 (**Exhibit 10**).

Exhibit 10
To be revenue neutral in the transition to an OA-only model, we estimate the average Elsevier APC would have to rise to £3,200, a c.70% increase (or Elsevier should accept more articles for publication)

£ million	**2011**
Total Elsevier revenues	2058
Journals as % of total Elsevier	50%
Total Journals revenue	1029
Articles published	316,000
APC/article published to break even with subscription model (£)	3256

Source: Reed Elsevier annual reports and presentations, interviews, Bernstein estimates and analysis

Can the market bear such costs? We very much doubt it. The Finch report budgets £38 million/year for APCs, assuming an APC in the region of £1,500/2,000. More practically, we think that research funding

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bodies and department chairs may be willing to fund expensive APCs for top tier journals (how much is a paper published in *Nature* or *Cell* worth, after all, if it builds the foundation for a Nobel Prize?) but will balk at paying anything like these amounts for journals which are not top tier.

We have made four simulations. We have built a best case scenario which assumes that 50% of Elsevier journals achieve average APCs of £4,000 (roughly a 100% increase on the current APC) and 50% earn APCs of £650 – the high end of the range for OA APCs charged by commercial publishers according to Solomon and Bjork. We have also built a base case, in which 33% of journals earn APCs of £4,000, 33% earn APCs of £1,000 and the final 33% earn APCs of £650. In both cases, the profitability of Elsevier would plummet substantially (again, assuming that costs do not change): in our best case, which looks generous to us, Elsevier's journal margin would plummet to 16% and in the base case it would turn negative (**Exhibit 11** and **Exhibit 12**).

Exhibit 11

In our best case OA-only scenario, the profitability of Elsevier's journal business would decline to 16%...

£ million	2011
Total Elsevier revenues	2058
Journals as % of total Elsevier	50%
Total current Journals revenue	1029
Articles published	316,000
Top Tier articles as % ot total articles	50%
Average APC of Top Tier articles (£)	4,000
Low Tier articles as % ot total articles	50%
Average APC of Low Tier articles (£)	650
Total OA revenues	735
Total costs	617
Operating profit	118
Operating profit %	16.0%

Source: Reed Elsevier annual reports and presentations, interviews, Bernstein estimates and analysis

Exhibit 12

…and in our base it would turn slightly negative (before any cost cuts)

£ million	2011
Total Elsevier revenues	2058
Journals as % of total Elsevier	50%
Total Journals revenue	1029
Articles published	316,000
Top Tier articles as % ot total articles	33%
Average APC of Top Tier articles (£)	4,000
Mid Tier articles as % ot total articles	33%
Average APC of Mid Tier articles (£)	1,000
Low Tier articles as % ot total articles	33%
Average APC of Low Tier articles (£)	650
Total OA revenues	589
Total costs	617
Operating profit	(28)
Operating profit %	(4.7)%

Source: Reed Elsevier annual reports and presentations, interviews, Bernstein estimates and analysis

We have then created two additional cases, in which Elsevier takes the 534,000 articles it receives but does not publish (the difference between 850,000 and 316,000) and we have added those revenues to our best and base cases. This number is possibly too high, as it is possible that some articles rejected on top Elsevier journals are then published by another one, but we conservatively considered them unique rejections. We

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then assumed that Elsevier published all these 534,000 articles in new OA journals with no editorial screening (i.e. journals which will publish every article submitted, provided it passes its peer review process). It is difficult to know the stand alone costs of publishing these articles – but Solomon and Bjork found that "megajournals" publishing everything can charge APCs of $1000/1500, equivalent to £600/900. Assuming that these hypothetical Elsevier "OA megajournals" would charge a mid-price APC of £750 and incur additional costs per article that would only 33% of the costs incurred on the existing journals (i.e. £650/article), the total profit of the journal business would rise from £118 to £171 million in our best case and from -£28 to + £26 million in the base case scenario, still respectively a 58% and a 94% decline compared to our estimate of the 2011 operating profit (**Exhibit 13** and **Exhibit 14**).

Exhibit 13
Launching OA "megajournals" would improve the economics to some extent…

£ million	**2011**
Total Elsevier revenues	2058
Journals as % of total Elsevier	50%
Total current Journals revenue	1029
Articles published	316,000
Top Tier articles as % ot total articles	50%
Average APC of Top Tier articles (£)	4,000
Low Tier articles as % ot total articles	50%
Average APC of Low Tier articles (£)	650
New OA "megajournal" articles	534,000
Average APC of "megajournal" articles (£)	750
Total OA revenues	1,135
Total costs	964
Operating profit	171
Operating profit %	15.1%

Source: Reed Elsevier annual reports and presentations, interviews, Bernstein estimates and analysis

Exhibit 14
…but would not change the overall conclusions

£ million	**2011**
Total Elsevier revenues	2058
Journals as % of total Elsevier	50%
Total Journals revenue	1029
Articles published	316,000
Top Tier articles as % ot total articles	33%
Average APC of Top Tier articles (£)	4,000
Mid Tier articles as % ot total articles	33%
Average APC of Mid Tier articles (£)	1,000
Low Tier articles as % ot total articles	33%
Average APC of Low Tier articles (£)	650
New OA "megajournal" articles	534,000
Average APC of "megajournal" articles (£)	750
Total OA revenues	990
Total costs	964.1
Operating profit	26
Operating profit %	2.6%

Source: Reed Elsevier annual reports and presentations, interviews, Bernstein estimates and analysis

Why is so difficult for Elsevier to achieve adequate revenues in an OA world? Very simply, because bundling journals would not work any longer. At present, the company is able to sell at no extra cost its

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lower-readership journals thanks to the "Big Deal" bundles. In other words, the top, "must have" journals take with them all the other titles, and Elsevier incurs no additional costs when adding titles distributed electronically to its bundles. In an OA world, on the other hand, each journal stands to compete with journals of similar ranking for publication, and the APCs are too different (reflecting the different ratios between submitted and published articles) to find an average price that works well for a portfolio of publications. Moreover, additional volumes of submissions drive costs, effectively creating liabilities for the publishers.

Could Elsevier offer "Big Deal" contracts to universities or funding bodies and bundle its journals for OA publication? In theory yes, of course. But the difficulties would be many folds.

- An average pre-set APC risks drawing only submissions for top-tier journals, since – if an article cannot win publication in any top ranked journal – there would always be an incentive for departments and funding bodies to shop around articles among lower-tier journals for the best price (journals which no one reads are a commodity). In addition, as we have seen, the current average APC is nowhere near where it needs to be in order for Elsevier to achieve revenue neutrality.
- A blank "all you can eat" agreement would leave Elsevier exposed to unpredictable volumes of submissions and unknown costs against pre-set revenues. Elsevier could try to mitigate this risk by introducing a flat fee plus an additional APC per article over a pre-defined volume ceiling, but the risk is that – once again – once the ceiling is met (preferably by concentrating submissions to top tier journals), departments and funding bodies would shop around for the best price the lower-impact articles.
- Regardless of the model chosen (and even assuming that one of the models described above works, which we doubt) developing an experience base to assess prices would take time, leading to a transitional period of instability when revenues and earnings could swing wildly, introducing an element of unpredictability to the overall performance of Elsevier.
- Bundles require two parties to agree. The academic community is not unanimously supportive of Elsevier (this may in fact be the understatement of the year), as the frequent spats with academic librarians and the rise of an increasingly well-organized and belligerent (by academic standards, of course) OA movement prove. There would probably be a lot of suspicion around any "bundle" Elsevier offers, particularly around a new and untested model.

So why was Elsevier supporting the Finch report? We suspect that it viewed the alternative recommendation (a strong backing of Green OA) as a much worse outcome. We are still wondering, however, whether Elsevier is miscalculating (they have proved error-prone again and again lately) or is hoping that the OA movement will stop at some declaration of good intentions or, in the worst case, at Dover. Of course, all these are plausible explanations; time will tell.

The potential impact on the profitability of Reed Elsevier should not be underestimated

We believe that STM journals are a major contributor to the profitability of Reed Elsevier. We estimate they operate at a 40% margin, which means that – while they represent only 17% of Reed Elsevier group revenues, they may account for as much as 25% of the group operating profit. In the past we have argued that the budget constraints affecting academic libraries would pose a major challenge to returning to organic growth in the 5%+ region, as the journals achieved before the onset of the recession of 2008. Our model is still based on the assumption that OA would not happen, and that investors would see the impact of this budget crisis primarily through the progressive decline of the organic revenue growth rate below consensus expectations, as multi-year contracts are signed with lower revenue growth provisions (and a larger number of Big Deals are abandoned in the quest for cost savings). Consensus expects Elsevier to

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return to organic growth in the 3% range by 2014, while we expect underlying growth rates below 1.5% for the next three years.

A collapse of the profitability of Elsevier would be catastrophic for Reed Elsevier. As we pointed out earlier, we believe that in 2011 Elsevier journals accounted for 25% of the overall group operating profit. Looking at our 2015 forecasts, a decline in the profitability of the Elsevier journals (our best case) would reduce group adjusted operating profit by c. -14%, while the collapse to a negative profitability (our base case) would shrink the metric by c.-27% (**Exhibit 15**).

Exhibit 15

Our best and base case for a transition to OA would imply that the 2015 Adjusted Operating Profit would decline by c. -14 and c. -27%, respectively

	2015e	
Reed Elsevier (£million)	**Best**	**Base**
Elsevier Revenue, £m	2,111	2,111
Est. Journals, % Elsevier Revenues	50%	50%
Est. Elsevier Journals Revenue, £m	1,056	1,056
Elsevier Journals OPM, %	40.0%	40.0%
Elsevier Journals OPM, £m	422	422
Elsevier Journals OPM, % (reduced)	16.0%	(4.7%)
Elsevier Journals OPM, £m	169	(50)
Reduction, £m	(253)	(472)
Reed Elsevier Group OPM, £m	1,773	1,773
Reduction, % total	**(14%)**	**(27%)**

Source: Bernstein estimates and analysis

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In summary

We still do not know whether OA's moment is finally coming, after a decade (or longer) of failed starts. To the extent that this process is now driven by political decisions, it is always subject to changes and reversals. Moreover, the subscription publishers are large and well organized, so they will definitely move to lobby, both openly and behind the scenes, for reversing some of these decisions. Until now, apart from generic protestations about doing "what is right for science" which draw increasingly loud jeers from the scientific community, they have used arguments centred on the risk of job losses posed by OA, but have not provided much evidence for that. Of course, a significant revenue decline at Elsevier could trigger redundancies, and it is not apparent that OA publishers could compensate for those losses (after all, if costs and staffing levels are largely driven by article submissions, these are not likely to be much affected one way or the other by a shift to OA). On the other hand, more access to scientific and medical information may prove beneficial to society at large (for the sake of brevity, we are omitting listing the findings of several academic researchers who have assessed the societal benefits of OA, primarily thanks to job generation in small- and medium-sized companies which are currently unable to afford the subscription fees of STM journals in their respective fields).

Our analysis shows that Elsevier journal revenues would be under significant threat because the APCs it would earn for many of its publications are unlikely to prove anywhere near what the company needs to be revenue neutral, and it is difficult to envision APCs that are high enough for its leading titles (the top 5/10%) to make up the gap. The issue is posed by the very competitive APC price points offered by competing publications: except for leading titles, the real value of publishing on the "long tail" of journals (at least 50% of the titles, and perhaps as much as two thirds) is not distinguishable from that of competing journals.

How will Elsevier respond? Probably by arguing three main points:

- that the breadth of adoption of OA policies could be limited to the UK only, that the EC recommendation could take years to become a set of national policies, and that in the US nothing has happened beyond the NIH Public Access Policy (and that this policy has had no tangible impact on Elsevier's business so far – something which stands directly in conflict, as we have pointed out before, with the statements rendered a number of times by the AAP about job losses driven by Public Access Policies).
- that the timeframe of implementation is uncertain (which is really not the case in the UK but it is true to some extent in the rest of the EU, although the availability of funds to back the EC recommendations suggests that policies could be voted sooner than many think).
- that compliance rates for mandates in the academic world are highly variable, unpredictable and – in general – low (which is true, but with the big warning that a lot depends on whether policies have teeth: it will be enough to publicize a few grants rejections on the ground of past violations of mandates to raise compliance levels). The mandatory NIH policy raised compliance, which stood at 19% between May 2005 and December 2007 (when compliance was voluntary), to about 75%.

To the extent that politics, rather than market forces, are driving this shift, it is easy to under estimate the impact that the market can have in how the OA model evolves. Ultimately, politicians seem anxious to appease all parties to some extent, instead of letting Green and Gold OA sort themselves out. This is ultimately relevant for Reed Elsevier investors, because it is conceivable that a diminished Elsevier could survive in a Gold OA environment, while in a Green OA with short embargo periods most academic libraries would probably opt to subscribe to key titles only, gaining access to the other publications (which no one cares much for or reads anyway, as we have seen) through repositories. But even if Gold OA prevails on the back of the UK model, Elsevier risks a substantial decline in revenues and profits. Reed Elsevier investors would do well to pay a lot of attention to the evolution of this debate.

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Disclosure Appendix

Valuation Methodology

Reed Elsevier

For Professional Publishers in our coverage, including Reed Elsevier, we base our target prices on a price-to-earnings methodology. In order to calculate our target prices, we look at each company's current relative multiple (company price to earnings ratio, P/E, relative to MSCI Europe P/E) and then apply a target relative multiple given each company's future EPS growth prospects to 2014 (**Exhibit 16**). We believe that the period between 2011 and 2014 represents a valid timeframe to assess the EPS growth prospects to 2014.

Exhibit 16
Valuation Methodology – Reed Elsevier

Company	Rating	Currency	Market Cap	6-Sep-12 Price	EPS CAGR 2011-14E	2012E EPS	2012E P/E	Relative P/E Multiple	Target Relative P/E Multiple	Target Price	% Upside Downside
Reed Elsevier PLC	U	GBP	£7,230	604.0p	3.2%	47.6p	12.7x	112%	90%	400p	-34%
Reed Elsevier NV	U	EUR	€ 7,785	€ 10.65	5.2%	€ 0.90	11.9x	104%	90%	€ 7.00	-34%
MSCI Europe					**7-8%**		**11.4x**				

Source: Company reports, Bloomberg, Bernstein estimates and analysis

Risks

Reed Elsevier

The key risk to our thesis and 12 month target prices for Reed Elsevier derives primarily from the impact of the economic cycle and from M&A activity. While most of the revenues should be relatively stable irrespective of changes in economic activity, some segments (and in particular business to business advertising and exhibitions) are more sensitive than others, as none of them is fully insulated from a deep and lasting slow down of economic activity and, conversely, a faster than expected improvement of the economic cycle could drive an acceleration of earnings growth.

We are assuming that – in the next 12 months – management will continue to try "fixing" the structural issues we have identified, rather than selling assets. A divestiture of significant parts of the portfolio (the exhibition business or LexisNexis Legal & Professional) would probably trigger a re-rating of the stock.

While market shares are relatively stable, fluctuations deriving from failure to win individual contracts or clients can negatively or positively affect the revenues of some divisions for a few years, since many contracts are typically multi-year and switching costs are high.

In addition to the risks mentioned above, Reed Elsevier is highly exposed to currency fluctuations: approximately 55% of its revenue is denominated in US dollars. A 1% change in the US Dollar causes around a 0.6% change in EPS. Any major devaluation of the sterling and/or the Euro relative to the US dollar would have a direct positive effect both on EPS and on the value of assets located in the United States.

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  Outperform: Stock will outpace the market index by more than 15 pp in the year ahead.

  Market-Perform: Stock will perform in line with the market index to within +/-15 pp in the year ahead.

  Underperform: Stock will trail the performance of the market index by more than 15 pp in the year ahead.

  Not Rated: The stock Rating, Target Price and estimates (if any) have been suspended temporarily.
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12-Month Rating History as of 09/09/2012

Ticker	Rating Changes
REL.LN	U (RC) 03/10/11
REN.NA	U (RC) 03/10/11

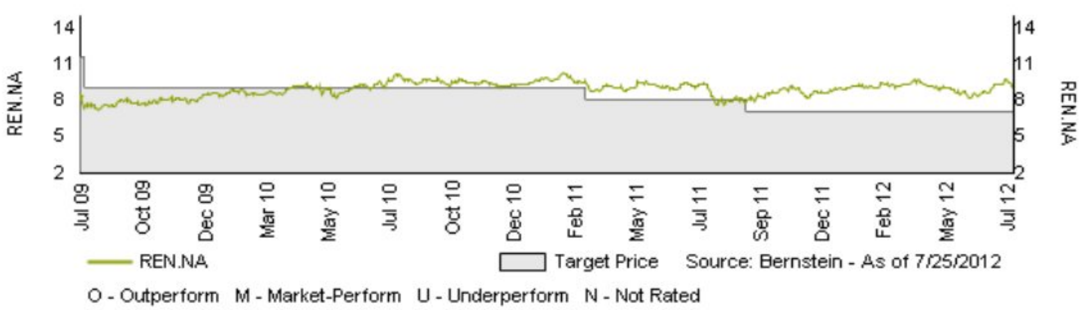
Rating Guide: O - Outperform, M - Market-Perform, U - Underperform, N - Not Rated
Rating Actions: IC - Initiated Coverage, DC - Dropped Coverage, RC - Rating Change

REL.LN / Reed Elsevier PLC

Date	Rating	Target(GBp)
07/16/09	O	625.00
07/31/09	O	500.00
05/07/10	M	500.00
03/10/11	U	450.00
09/14/11	U	400.00

REN.NA / Reed Elsevier NV

Date	Rating	Target(EUR)
07/16/09	O	11.50
07/31/09	O	9.00
05/07/10	M	9.00
03/10/11	U	8.00
09/14/11	U	7.00



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