Dear Directorate General for Competition,

We are writing to you in the capacity of a group of researchers who benefit from the production of scholarly research articles, and also as authors of scientific articles that fall under the scholarly publishing market.

We write to notify you of what we believe to be the anti-competitive practices of RELX Group in the scholarly publishing and analytics industry, based on the following two articles of the Treaty of the Functioning of the European Union (TFEU):

1. Article 101 of the Treaty, which prohibits agreements between two or more independent market operators which restrict competition; and

2. Article 102 of the Treaty prohibits firms that hold a dominant position on a given market to abuse that position.

This complaint regarding RELX Group, and specifically its daughter company, Elsevier, is based on the following grounds:

1. General problems within the scholarly publishing market sector that actively prohibit competition in the common market between EU member states (Article 101); and

2. Abuse of a dominant position within this market (Article 102).

The grounds on which we believe these statements to be true are set out below with reference to the primary academic literature that has been studied, the general scholarly publishing landscape in the EU, previous competition inquiries, and financial statements from RELX Group. In 2002, the UK Office of Fair Trading Standards published a report (OFT 396) of its investigation into the market for Scientific, Technical and Medical (STM) journals. Here, the report concluded that the journal market was not functioning well due to inelastic demand, a lack of price competition and sensitivity, and that regulatory intervention would be required should conditions fail to improve. Here, it is our view that the natural interventions proposed in the report (price restraint from commercial publishers; increased buyer power; academic power; and the impact of new Web technologies) have not occurred, and we shall provide evidence to demonstrate that each of these factors is still contributing to what we believe is a dysfunctional market.

The present complaint follows a similar referral of RELX Group to the UK Competition and Markets Authority in 2016[1], following the recommendation of (then MP) Ann McKechin, previously in a BIS sub-committee hearing in 2013. Here, she advised that RELX Group (at that time known as Reed Elsevier) should be referred to the competition commission if it continued to use non-disclosure agreements, which she termed a "profoundly anti-competitive practice", and said that if this was happening with public funds "there should be a referral to the Office of Fair Trading". To date, there has been no formal response to this referral, and, as we shall demonstrate, it is our view that these anti-competitive practices and dysfunctional market conditions continue and do not serve either researchers, institutes, or the public interest effectively.

We focus primarily on Elsevier, its history and present business practices, the ongoing threat it continues to pose to the present scholarly publishing market, and the wider implications that these has on the role of scholarly research in society. Elsevier is the single largest publisher of scholarly research articles, owning more than 2,500 scholarly journals, and between 2012 and 2015, Elsevier published almost 1.4 million journal articles, the vast majority of which are not publicly accessible. In relative terms it is one of the smallest Open Access publishers, publishing just 27,000 OA articles in 2017 out of 436,000[2] (around 6.2%). We fully acknowledge that much of what we discuss in this complaint can also be applied to other major players within the wider scholarly publishing market, and discuss some additional details to provide this context.

Background

The EU Higher Education sector is funded through a variety of public, private, and philanthropic streams. How this is administered through the various EU member states is highly variable, but has one thing in common: from these pools of money, a fraction is devoted to the purchasing of subscription access to scholarly journals, books, and databases that are critical to future research and higher education in the EU. The European Commission themselves are an important funder for these activities throughout Europe as a whole. Streamlined access to these resources is essential for the modernisation of education

[1] Referring Elsevier/RELX to the Competition and Markets Authority (Accessed 27/07/2018). Please note that two of the present authors were involved in this referral.

[2] 5 surprising facts you might not know about Elsevier and Open Access. (Accessed 28/07/2018).

programs, advancing quality research and innovation, and equipping graduates and researchers with high-level transferable skills, as well as all of the wider benefits to society that these resources bring.

In a pre-Internet era, scholarly publishers were tasked with the crucial roles of printing and dissemination of physical goods. However, now using widely available Web-technologies, industries like scholarly publishing should have benefited from massive reduction in the costs associated with these key services, and economies of scale; however, Elsevier and other publishers have profited from the impact of the Web by diversifying their services, but the expected concurrent reduction of costs has not manifested, or reflected in the prices they continue to charge. The total size of the global Scientific Technical and Medical (STM) publishing market in 2013 was estimated by Outsell at USD $25.2 billion, with around 68-75% of this coming from academic library subscriptions[3]. The vast majority of this is gained through selling research content that higher education institutes produce back to those same institutes through a range of licensing agreements.

Traditionally, individual academic institutes have negotiated subscription licensing agreements on an individual basis with a number of scholarly publishers. This has created a heterogeneous and fragmented landscape based on the affordability to individual institutes, which is often contingent on funding that they make available through their respective library budgets. In recent years, there has been the formation of numerous national bodies or consortia that now negotiate nationwide licensing contracts on behalf of research institutes. For example, Jisc in the UK, VSNU in the Netherlands, Project DEAL in Germany, and Bibsam in Sweden. The establishment of these consortia represents the first time in which collective bargaining has been leveraged in an attempt to place downward pressure on some scholarly publishers due to their regressive business practices, and for actively delaying the EU's vision towards a full transformation to Open Access.

A further principle aim of these consortia has been to work with scholarly publishers to help accelerate the transformation of a subscription-based system to one of Open Access (OA). Here, all global citizens would have the intrinsic right to freely access and, depending on copyright and licensing constraints, re-use the outputs of scholarly research; something that is so important that it is embedded into Article 27 of the UN Universal Declaration of Human Rights[4]. This universal access is intended for the betterment of a healthier society, to accelerate scientific research and discovery, to catalyse further innovation in the

[3] The STM Report: An overview of scientific and scholarly journal publishing.

[4] UN Universal Declaration on Human Rights, proclaimed by the United Nations General Assembly in Paris on 10 December 1948.

private and public sectors, and drive economic growth. This is a key aspect of the EU's vision for Horizon Europe and Horizon 2020[5], but the pace of transformation has been slow, costly, and complex. Many publishers have shown little initiative to help realize this vision and alleviate the current obstacles, many of which are intrinsic to maintaining their businesses.

This relatively slow rate of change towards OA recently catalysed the release of 'Plan S' to help accelerate the transition towards full and immediate OA to scientific publications[6]. However, the impact that Plan S will have on both the subscription and OA market remains eminently unclear, especially given uncertain present market conditions. For example, Plan S foresees a price cap on article-processing charges (APCs) for OA, but it is not yet public how this cap will be set, what it will be based on, and how publishers respond to it. This is another prime example of how these pricing schemes do not really operate as a true 'market' (see below for more on this). However, in previous scenarios where such a cap has been enforced (e.g., the UK higher education system for tuition fees), what this created was a system where every university simply charged as much as possible, trending towards the maximum, with this price reflecting little to do with the underlying costs or services. Such a system is undesirable for virtually everyone, except those who exploit the caps. Furthermore, a recent report on behalf of the European Commission concluded that "pursuing a short-term increase in access, at any cost, is unlikely to lead to a more competitive and sustainable market"[7], and therefore it is likely that Plan S will have little effect on impacting wider market conditions. Thus, we believe that there is still scope for this complaint and intervention from the EC despite wider changes currently happening within the scholarly publishing system.

The scholarly publishing 'market'

Non-substitutable goods

Here, it is worth noting that we believe the term 'market' is not entirely appropriate for the scholarly publishing industry. A key aspect of any well-functioning market is the concept of substitutable goods - that is, if one is not satisfied with the quality or value of a product, it can be substituted for another. This

[5] Guidelines to the Rules on Open Access to Scientific Publications and Open Access to Research Data in Horizon 2020, European Commission, ver 3.2, 21 March 2017.

[6] Plan S: Accelerating the transition to full and immediate Open Access to scientific publications, Science Europe.

[7] Towards a Competitive and Sustainable OA Market in Europe - A Study of the Open Access Market and Policy Environment - OpenAIRE.

fuels competition and innovation in any market, and ultimately wider economical and societal benefits. In the case of scholarly publishing, this simple aspect of a free market is entirely absent, and in our view represents an undesirable quality of the current state of scholarly communication (Eve, 2014). This lack of substitutability affects both authors and readers, both of which are typically researchers. Each scholarly journal and each research article that a journal contains is absolutely unique and non-rival - that is their purpose, and their inherent value. This end product is the result of the strong differentiation that peer review typically administers around each article. For research to progress, access to all available relevant sources is required, which means that there is no ability to transfer or substitute products, and there is little to no inter-brand competition from the viewpoint of consumers. If a research team requires access to knowledge contained within a journal, they must have access to that specific journal, and cannot substitute it for a similar one published by a competitor. Indeed, the entire corpus of research knowledge is built on this vital and fundamental process of building on previously published works, which drives up demand for all relevant published content. As such, publishers do not realistically compete with each other, as all their products are fundamentally unique (i.e., each publisher has a 100% market share for each journal or article), and unequivocally in high demand due to the way scholarly research works. The result of this is that consumers (i.e., research institutions and libraries) have little power to make cost-benefit evaluations to decide whether or not to purchase, and have no choice but to pay whatever price the publishers asks with little transparency over costs, which we believe is a primary factor that has contributed to more than a 300% rise in journal prices above inflation since 1986. Thus, we believe that a functional and competitive market is not currently able to form due to the practices of dominant players, like Elsevier, in this sector.

Ultimately, these states prevent public higher education institutes from using their funds to invest in sustainable or more diverse services as part of any competitive market. A major consequence of this is that alternative systems and services become excluded, as they are unable to compete with the dominant players, despite often being more cost-effective, efficient or sustainable options. This issue is compounded by the issue of prestige and career advancement for individual researchers, which automatically imposes a strong bias against newer or innovative entrants to the marketplace. The result of this is the illusion of a functional scholarly publishing market, whereas the reality is that each single research article functions as its own, non-competitive and monopolistic micro-market, in which copyright-protected high prices can be set that need not be related to any of the actual underlying costs (Armstrong, 2015). Thus, it is our view that scholarly publishing is a special type of market, but it remains presently unclear whether it is this monopolistic nature of each article, or the high aggregate measure of journal

concentration among a few selected publishers, which creates most dysfunction in the present market. This requires particular precautions in order to make sure that the economic activities of Elsevier and others still comply with EU competition rules, the absence of which we believe to represent a practice that contravenes Article 102 of the FTEU.

Non-disclosure agreements

For a legitimate and free-functioning market to exist, there must be fair price competition, which we believe is clearly absent; primarily due to the widespread use of non-disclosure agreements (NDAs) between publishers and their clients. The limited evidence available (e.g., Lawson et al., 2015) shows that this absence is real and harmful, with large price disparities among clients for essentially the same services, and also irrespective of what other publishers are charging. This condition is generated by the practices of Elsevier and other large publishing companies, who have little incentive to allow such a competitive marketplace to exist, as this will directly impact upon their revenue streams. In our view, the result of this is the apparent misuse of substantial amounts of taxpayer money each year and continued damage to the higher education sector and the benefits that this brings to wider society. For example, through demonstrated inconsistencies in negotiated price for comparable research institutions, which does not align with the fundamental role of governmental agencies to distribute research funding in order to deliver a return on taxpayers' money.

The costs of licensing agreements between Elsevier and individual organisations are difficult to obtain, as they are typically legally protected by confidentiality clauses, imposed by the publishing houses. Because there is little price sensitivity, Elsevier journals essentially charge as much as they possibly can, simply because this is what they can get away with being paid. A very conservative estimate from the EUA Big Deals Survey suggests a cost of around €400 million per year in Europe. We believe that these non-disclosure agreements severely act to the detriment of the entire scholarly market, to the benefit of no-one but Elsevier, by preventing other clients and organisations from being able to see how much each pays for their individual licensing agreements. As such, they are explicitly emplaced to prohibit any sort of active or fair price competition, despite the fact that the products being sold by different parties are of little material difference. It is clear to us that this anti-competitive practice prohibits the functioning of any sort of sustainable[8] market for scholarly publishing based on competitive pricing and consumer

[8] Note here that when we say 'sustainable', we do not mean it in the context that publishers often use (i.e., sustainable business growth); we mean it in terms of what we believe to be appropriate expenditure of public funds.

satisfaction. This practice has become deeply embedded as a standard practice between the largest scholarly publishers, and leads to an overall dysfunctional scholarly publishing market (in our view contravening Article 101 of the TFEU). The fact still stands that public access to important information about cost, required for a functioning market to develop, is being sacrificed in order to protect the financial interests of Elsevier.

In 2013, David Tempest, previous Director of Access Relations at Elsevier, argued that if other libraries/institutions of higher education worldwide were to know the amount Elsevier charges for access, "everybody would drive down, down and down" on prices, leading to users paying less for accessing these materials (i.e., the goal of fair market competition). This is a somewhat embarrassing, but eye-opening, statement captured on video at a public event[9], and is direct admittance from an Elsevier employee about how they control the market through anti-competitive practices. Thus, the fact is that there is potential for such a functioning competitive market based on existing services, but Elsevier actively prohibit this through their current business practices. The result of this is that Elsevier apply dissimilar pricing conditions to equivalent transactions with other trading parties (at the institutional and national level, as indicated above), placing them at a significant competitive disadvantage and decreasing their welfare as consumers; in our view this is in direct conflict with Article 102 of the FTEU.

Oligopoly of scholarly publishing

Due to the aforementioned widespread use of NDAs, data on many of the financial aspects of scholarly publishing are opaque. The scant information available on financial flows has come from the use of Freedom of Information requests, and available only in a few nations around the world (e.g., the USA, New Zealand, and the UK). For example, UK universities spent £40 million to access full-text articles through ScienceDirect between 2010 and 2014 (Lawson et al., 2015); content that is otherwise predominantly inaccessible to non-subscribers. Around 26% of Elsevier's total income currently comes from Europe[10]. These attempts to improve transparency through FOI requests have often come from individuals concerned about the state of the industry, and indicate that a concerted policy-led action is required now in order to improve the state of competition in the market. A recent report from the European University Association provided some insight into the expenditure of 28 EU member states on

[9] Taylor, Mike (2013) Elsevier's David Tempest explains subscription-contract confidentiality clauses. Youtube. (Accessed 28/07/2018).

[10] RELX Group Annual Reports and Financial Statements 2016 (Accessed 30/07/2018).

'big deal' contracts, providing the first insight into the landscape in Europe and revealing great disparities in the cost of Big Deals across Europe, which seem to exist irrespective of the different levels of cost transparency due to national legislation[11].

A recent, independent, and reasonable estimate in our view is that a grouping of Taylor & Francis, Wiley-Blackwell and Elsevier together account for over 50% of all published science papers in 2013, with Elsevier owning around 25% of the total market (Larivière et al., 2015). This same study showed that Elsevier's dominance is as high as 71% for fields such as psychology, which indicates a clear monopoly over certain research disciplines. The process of consolidation and concentration continues, perhaps emphasised best by the 2015 merger of Springer and Nature Publishing Group into Springer Nature; now the second largest scholarly publisher. Due to the unique characteristics of the scholarly journal market, different players dominate specific subsets. For example, Sage is the dominant publisher in Humanities and Social Sciences, while Springer Nature, Wiley, Elsevier, and Taylor and Francis together publish around 50% of all medical and natural science research, based on the most recent estimates. The 2002 OFT report noted that Elsevier had a "a forty one percent share of the supply of science and technology journals". Elsevier themselves claim to publish just 17% of the world's research articles[12], although the basis for this estimate is unknown, and is contradictory to a range of independent analyses. The STM report in 2015 noted that Elsevier were the second biggest publisher after Springer based on number of journals alone (Ware and Mabe, 2015; Table 3). According to data provided by SciLit, Elsevier are the top publisher by articles, more than twice the size of its next competitor, Springer Nature, and publishing 20.7% of the total global number of articles in 2017[13].

In some countries such as Switzerland, Elsevier publish 22% of all articles, and are by far the largest publisher of Swiss research. It has also been recommended that the ETH board in Switzerland refer Elsevier to the Competition Commission (in 2016) to evaluate whether they are abusing this dominant position[14]. In other countries, such as Finland, total costs of subscriptions to Elsevier between 2010 and 2015 increased by 34% (€6.41 million in 2010 to €8.58 million in 2015)[15]. These revenue increases now

[11] EUA big deals survey report: The First Mapping of Major Scientific Publishing Contracts in Europe (Accessed 03/09/2018).
[12] This is Elsevier. (Accessed 28/07/2018).
[13] Market distribution per publisher, SciLit. (Accessed 30/07/2018).
[14] The ETH Domain and Elsevier: Part 1, Christian Gutknecht. (Accessed 30/07/2018).
[15] Scientific journal subscription costs in Finland 2010-2015: A preliminary analysis, rOpenGov. (Accessed 30/07/2018).

consume 34.3% of the total costs paid to publishers by Finnish universities. Similar to Finland, information obtained in the Netherlands from FOI requests revealed that more than 25% of the total national expenditure on serials goes towards Elsevier, around three times more than their closest competitor (Wiley Blackwell)[16]. The VSNU released the 2018 Elsevier subscription agreement[17], revealing that the national cost of this was €12.2 million. None of these factors help the digital economy and scholarly publishing market to grow through fair competitive procedures. Rather, we believe that they are about consolidating Elsevier's dominant position in this sector, while stifling economic growth or innovation.

This oligopoly (i.e., collective dominance of the marketplace by a few actors) formed after an extensive period of mergers and high-profile acquisitions by Elsevier and others (Sage, Taylor and Francis, Wiley, and Springer Nature), which accelerated from the late 1990s and onwards, catalysed in part by the systemic transition to online publication for journals. An independent study revealed that in the last 20 years alone, Elsevier have acquired or merged 340 organisations, tools, or services, primarily composed of other journals, publishers and analytical services[18]. The impact of this consolidation, combined with a general lack of transparency, is that new entrants face increasingly high barriers to an increasingly exclusionary market (although see above on why the reality is that no legitimate marketplace actually exists), and smaller players (including learned societies) reduce their market share and are eventually forced out. This competitive edge was noted in the 2002 OFT report, which noted that Elsevier has a positional advantage to exploit over new entrants to the market. Here, no matter how efficient or beneficial new journals/services might be, Elsevier's dominant position makes it more difficult for others to gain any sort of establishment or reputation. Further consequences include artificially high and increasingly unaffordable costs, limited utility of research outputs, proliferation of well-documented Western publishing biases, and continued systemic lock-in.

Excessive profit margins at the expense of the public

In 2013, the revenue from Elsevier's Science, Technology and Medicine (STM) division was £2,126 million, with an adjusted operating profit of £826 million (39%). They have a fairly consistent adjusted profit margin of around 37%, which has increased from around 33% in 2002 (note that it could even be as high

[16] Overview of costs incurred by universities for books and journals by publisher, VSNU. (Accessed 30/07/2018).
[17] Elsevier Subscription Agreement, VSNU.
[18] Preliminary Findings: Rent Seeking by Elsevier. Publishers are increasingly in control of scholarly infrastructure and why we should care, Alejandro Posada and George Chen. (Accessed 16/09/2018).

as 40-50% for their STM division before tax[19]). This level is more than double of that commonly found in the oil industry (approximately 16%), and far outstrips pharmaceutical companies (around 6.5%). It is noteworthy that these profit margins were not affected even when the rest of Europe was suffering from the deepest of economic crises. The latest figures from 2017 reported an underlying growth in adjusted profit margins of 6% over 2016[20]. The majority of this revenue comes from institutional library budgets, with around 68-75% coming from public sources (Ware and Mabe, 2015). We feel that such continuously excessive margins also provide little incentive for behavioural changes in terms of increasing efficiency, and exist in spite of the fact that more efficient alternatives readily exist. This is a consequence of there being little real competition within the scholarly publishing market.

These continuous annual increases occur despite Elsevier's already excessive profit margins, also bearing in mind that much of its labour and products are provided for free from the research community. Typically, the research articles themselves are taken from researchers along with full rights to those works, and the quality control through an editorially-controlled peer review process is often performed as a pro bono service (although apparently some of their editors receive a nominal compensation, but information on this is not public). It is likely that if publishers were forced to either pay royalties to researchers for their work, or an industry-standard consultant rate to editors and reviewers, the entire scholarly publishing system would cease to function as it now does. While having high profits does not in itself contradict the FTEU, in this particular case they are the direct consequence of practices that do, as well as being based on what we believe are unethical relationships with the wider research community. This raises more fundamental questions about the relationship between the scholarly publishing market and the impact that it has on the wider higher education and research system.

Big deals

Elsevier typically offers 'subscription bundles' of individual journals, often called 'big deals', that lock research institutes into multi-year business-to-business contracts with steady annual price escalation for content, irrespective of whether they actually want, need or use individual titles within the bundle. What the 'big deal' essentially does is create a product in which it is conditional for a purchaser to buy all of the products offered from a dominant supplier. Thus, while there might be the possibility to decide on acquisition (licensing) for individual titles, it becomes much more difficult to do so when all titles from a

[19] Open Access: The true cost of science publishing, Richard van Noorden, Nature News. (Accessed 30/07/2018).
[20] RELX Group 2017 Results, Press Release. (Accessed 30/07/2018).

publisher are bundled. By their very nature, we believe these practices are abusive as - irrespective of the circumstances around them - they actively restrict competition and prevent other competitors from having any form of leverage within the market. This is especially the case for smaller or newer publishers, irrespective of how much more efficient and sustainable their services might be for the research community, and this capacity of Elsevier to enforce market discrimination must be investigated. Furthermore, as these agreements are often concealed by default (due to non-disclosure clauses), we believe that they are irresponsible while distorting any true competition, and therefore anti-competitive in multiple ways. Combined with Elsevier's market dominance, this practice is in direct contradiction with Article 102 of the FTEU.

Due to the size of Elsevier, the 'big deal' has become a powerful tool for enforcing their position, as refusal to purchase their products could have substantial negative consequences. These practices by Elsevier, and other large publishers, whereby the cost of subscriptions has outpaced that of inflation by almost 300% since 1986, have created a system where libraries could only afford access to an increasingly limited number of journals (Roth, 1990); a financial phenomenon widely called the 'serials crisis'. It is expected that, in 2019, there will be an additional 6% annual price increase for journal titles[21], which in our view is eminently unsustainable and continues to threaten research library budgets and the future of scholarly communication, while continuing to threaten and damage the global scholarly publishing market. This issue is now further exacerbated by the increasing focus on 'OA big deals', in which funds are reallocated from subscriptions to OA, but with the consequence that native OA publishers are discriminated against in the same was as through subscription expenditures. It is our belief that this situation represents the clear and ongoing abuse of a dominant market position, and contravenes Article 102 of the FTEU.

Hybrid Open Access journals

Elsevier is the largest hybrid Open Access (OA) publisher (Björk 2017). An independent 2014 study revealed that hybrid article-processing charges (APCs) from subscription-based publishers, such as Elsevier, were nearly twice as much as equivalent rates from publishers that published exclusively OA content (Björk and Solomon 2014). This higher rate, which is also what the wider 'hybrid market' seems to be converging on, at around £1,500-£2,000, appears to have arrived at least partially as a consequence

[21] Bosch, Stephen, Barbara Albee, and Kittie Henderson. Death By 1,000 Cuts | Periodicals Price Survey 2018. Library Journal. April 23, 2018. (Accessed 28/07/2018).

of the publication of the 'Finch Report' in the UK in 2012[22]. This report was heavily criticised by both independent researchers, and branches of the UK government. For example, it appears to have selectively excluded critical published data, leading to the promotion of specific agendas from the scholarly publishing industry, while making erroneous statements that equated high costs with high quality, and low costs with low quality. The UK stance of a stated preference for 'gold' OA has manifested as a preference for hybrid OA as a consequence of this, and is divergent from virtually all other national OA policies in the EU[23], and has been criticised as one of the key elements in further creating highly dysfunctional market conditions (Björk and Solomon 2014).

Data from the UK's Wellcome Trust revealed that the average APC for an Elsevier hybrid title was around 64% above that for fully OA titles[24]. This was supported by the 2015 review of the RCUK (now UKRI) OA policy, which also revealed that around 40% of OA articles published by Elsevier were non-compliant with the policy as they were not appropriately licensed[25]. The prices of these APCs do not actually appear to have anything to do with the cost of article processing. For example, Björk and Solomon (2014) showed that they are set more based on the levels of funding available for authors, and also normalised to some degree by discipline (Lawson, 2014). The result of this is that consumers are arbitrarily charged substantially higher prices that are virtually unconnected to the actual costs of supplying publishing services, actively discriminating against participants based on price, and constituting a behaviour that is objectively inefficient in creating fair and sustainable market conditions.

The reason why Elsevier, and other large commercial publishers, have this strong preference for hybrid OA is that they are able to leverage and raise the symbolic capital of their titles (i.e., branding and prestige), which they can use in turn to increase APCs. Due to this, hybrid OA has a high market concentration around major publishers, who still presently derive most of their income from subscriptions. In a marketplace where these symbolic factors primarily define where researchers submit their work, it makes new entrants to the publishing market disadvantaged right from the offset, irrespective of the intrinsic value they provide beyond prestige and branding. For example, it is now eminently feasible to disseminate information at a much lower cost thanks to the emergence of Web-based technologies including social networks, e-books, a range of self-publishing options, and the fact that

[22] Accessibility, sustainability, excellence: how to expand access to research publications: Report of the Working Group on Expanding Access to Published Research Findings.
[23] Who is paying for hybrid?, Danny Kingsley. (Accessed 30/07/2018).
[24] The reckoning: An analysis of Wellcome Trust Open Access spend 2013-14, Wellcome Trust.
[25] Review of the implementation of the RCUK policy on Open Access, RCUK.

electronic copying is essentially costless and the peer review process for scholarly articles is typically provided by researchers as a pro bono service; however, none of these options have impacted upon the scholarly information market, as Elsevier has the advantage in that it distributes prestige through its services, which comes at the cost of knowledge dissemination. We believe that Elsevier exploits this through a system of production limitation and artificial scarcity, despite the obvious technical developments that can easily overcome this, to the prejudice of consumers. It is also noteworthy that Elsevier appear to have persistently engaged in a practice known as 'double-dipping', whereby APCs for hybrid titles are accrued in addition to costs associated with subscriptions for those same titles, instead of offsetting those costs[26]. This is best exemplified with the recent renegotiations of the big deals with Sweden and Germany, in which it was consistently difficult to negotiate any sort of reasonable offsetting agreement with Elsevier. Finally, increasing APCs show that they are not sensitive to market conditions, but instead closely connected to the perceived value based on venue prestige and reputation.

The European Commission itself recognises that hybrid OA is unsustainable, and in June 2018, announced stated its intention that it would no longer pay APCs for hybrid titles under its 2021-27 Research and Development programme, which is a distinct shift from Horizon 2020 in which such fees were supported[27]. This was more recently followed up by similar statements by Plan S, in which 11 national research funding bodies (and growing) announced they would no longer support funding for hybrid OA. Nonetheless, the STM Association, which represents Elsevier and other publishers, shows strong support for hybrid OA[28], despite these statements from the EC, and also contrary to almost all published evidence that hybrid OA is not working well to create stable market conditions, or a transition to a full OA system. Indeed, one independent study demonstrated that Elsevier is financially unable to undergo a full transformation to an OA publishing system (Morrison, 2017). Thus, Elsevier and others are actively enforcing their collective position to try and maintain inflexible market conditions, and it might be the case that wider investigation is required to examine the extent to which these actors are collectively abusing the present market conditions. The hegemony of Elsevier represents the current paradigm of modern scholarly publishing, where increasing commercialisation is threatening the quality of research and equity within higher education more broadly. The outsourcing of reputation management to the commercial publishing sector has led to the situation in which a prestige economy is deeply and seamlessly integrated with the academic

[26] The cost of double dipping, David Prosser, Research Libraries UK (Accessed 06/08/2018).
[27] Commission staff working document: Impact assessment, European Commission.
[28] STM urges funders to retain hybrid open access as an option in the future, STM Association.

enterprise, which ultimately gives Elsevier control over how to set prices. It is our view that this represents abuse of a dominant market position, and contravenes Article 102 of the FTEU.

Vertical integration and user/vendor lock-in

Vertical integration of services creates a 'virtual lock in' environment for Elsevier's customers and users, ensuring that its digital services crowd out and exclude those of its competitors from the market. This applies particularly to a range of downstream competitive services within scholarly publishing and communication, and now represents the ongoing concentration of scholarly infrastructures by Elsevier and a small number of 'competitors' (Posada and Chen, 2018). The inherent risk of Elsevier's corporate restructuring into a data and analytics service provider is that through a system of vertical integration, they will now dominate the wider scholarly research ecosystem, while simultaneously owning much of the infrastructure that even its competitors use; something unprecedented in any other industry. We believe that this is Elsevier pre-empting the inevitable transition to full Open Access that it has been slowing down for some time now, while preparing to shift its vendor lock-in from 'big deals' into 'service big deal' packages.

The most recent example of this is the acquisition of the Aries publication workflow service. This service is used widely by other scholarly publishers, which will now therefore become dependent on Elsevier for functionality. This is the first time that a single publisher will have direct control over the publishing system used by its competitors, with little oversight to ensure that the service to, and data of, competing publishers will be protected. The effect of these acquisitions is to strengthen the already dominant position of Elsevier through all aspects of the scholarly communication process, while simultaneously threatening the future of scholarly infrastructures through enclosure of critical services. This will put important aspects of higher education at further risk, such as regarding faculty recruitment and retention, research productivity, university rankings, and probability of securing research funding. This transformation towards services and data analytics is also occurring within Taylor and Francis, Springer Nature, and Wiley (Posada and Chen, 2018), and we believe represents a broader systemic issue about ownership over critical academic infrastructure.

Elsevier also control data and analytics services that are used by universities (and other publishers) to assess the reputation of journals, researchers, and institutions. These services for citation metrics and alternative metrics/altmetrics (used to evaluate researchers) and for university rankings are in part based

on Elsevier's own journals, as well as those of its competitors. It is our belief that institutions feel that to be competitive they must have access to the journals that are used to assess their research quality, and in order to replicate the research assessment methodologies they are forced to buy into the same Elsevier-owned products, such as Pure and Scopus. This also means that you have a single provider in charge of not only a large proportion of scholarly publishing, but also in a strong position of analysing and evaluating that same system. The inherent conflict of interest here was demonstrated by independent research which showed that journals owned by Springer Nature, scored up to 40% lower using CiteScore rankings (based on Scopus data, owned by Elsevier), whereas Elsevier titles increased by around 25%, compared to their journal impact factors (owned by Clarivate Analytics and Web of Science). These figures were subsequently revised after incorporating the Lancet journal series (also now owned by Elsevier), and showed a similar pattern in that Elsevier journals still gained between a 10-12% rise compared to their impact factors, while Nature-branded journals were lowered by 25-40%[29]. Recently, these vivid conflicts of interest, particularly surrounding the European Commission's Open Science Monitor, led to a formal complaint to the EU Ombudsman, co-signed by more than 1000 researchers (Tennant, 2018). This issue was subsequently investigated by the Directorate-General for Research and Innovation of the European Commission, who, while providing substantial detail into the awarding process of Elsevier, did not directly or adequately answer many of these prominent concerns raised about the role of Elsevier. The response from the EC is currently being annotated in preparation for a counter-reply to request more information for the questions that were not sufficiently answered here.

To quote Posada and Chen (2018): "In both Elsevier and Wiley, institutions and individuals are encouraged to adopt the services due to inter-institution competition. In Elsevier, funding competition and the need for publication success drives this adoption, while in Wiley, cost reductions and competition between institutions for students serve as the rationale for this adoption. Yet in both cases, control is transferred to the publisher as their recommendations/consulting becomes increasingly "crucial" to achieving the goals of institutions/individuals, whether funding/publication or enhanced enrolment in education; with the motivations of the institutions in particular tied into the global university rankings. At the same time the integration of services by large publishers and the resulting dependence makes it harder for alternative services to emerge or succeed, particularly since they do not have the disproportionate access to content which can be used to reduce service operating costs in addition to being integrated into their

[29] Lancet Publishing Group, Eigenfactor.

service." We believe this summarises some of the core issues discussed within the present complaint, and helps to illustrate the wider context and importance of addressing them.

Negative impact of 'market' dysfunction on academic culture

The scholarly publishing market indirectly influences the structure of academia/HE institutes and individual career advancement, which is now often dictated by where researchers are able to publish their research, and the perceptions of journal prestige associated with this (based on branding, reputation, and marketing). In modern academia, this deeply entrenched cultural effect is so pervasive that it even has its own mantra, "publish or perish", and is perpetuated by publishers, researchers themselves, institutes, and funders due to the inappropriate association of journal reputation with academic reward systems. This strong coupling between career advancement requirements and commercial interests means that researchers are often highly constrained in their freedom of choice about where to publish, which creates a strong 'competitive' bias towards larger, more prestigious, and more-established players. Note that, in our view, this also means that cost and price associated with licensing agreements or OA have very little do with any fundamental aspects regarding the research itself, or the production costs, but are more based on the 'standing' (value) that a researcher receives from publishing in a particular venue. It is also worth conveying that one of the primary inputs necessary for these journals to function does not cost the journal itself anything. Articles are typically given freely by researchers, who often even have to pay fees for submission and publication, irrespective of whether the article becomes OA or not. It is not clear why this strange norm exists or persists, as it stands in stark difference to other branches of publishing. What this means is that, irrespective of the revenues and profits generated from subscriptions or OA big deals by publishers, none of this ever actually goes back to the authors required to generate that revenue in the first place; a factor which undoubtedly contributes to some of the exceptionally high profit margins seen by the biggest players in the industry. While this is not necessarily a violation of the TFEU, we believe that understanding the wider consequences of the dysfunctional scholarly publishing industry on academic cultures provides importance context to consider here.

Even with the ongoing evolution of OA, we believe that authors are largely only granted the illusion of 'free choice' because of the constraints of the evaluation system heavily relying on journal prestige. Recently, Springer Nature, one of the largest scholarly publishers, admitted in the prospectus for its

delayed IPO that it intended to continue to use the prestige of its journals to raise prices for Open Access[30]: "We also aim at increasing APCs by increasing the value we offer to authors through improving the impact factor and reputation of our existing journals"(page 99; note that this prospectus was removed from being online after it received widespread criticism and the IPO failed, but the authors of this complaint downloaded a copy during the window when it was available)[31]. This statement offered valuable insight into how traditional publishers view the current market place, with value differentiated based on journal brands, and capitalised on financially through the inherent need of researchers to compete for these exclusive brands. Even in the digital Web-based age where knowledge dissemination can be effectively unlimited, it is our view that these journals operate under the pretence of artificial scarcity that drives researchers to compete for their brands, which has ramifications for how the entire research process is both conducted and funded. Thanks to the power of the Web, it is essentially cost-free to distribute electronic journals to additional readers; however, the ideal outcome for a commercial publisher intent on generating profits is to extract maximum revenue from every single potential reader based on their willingness to pay; a strategy known as 'first degree' price discrimination. Thus, even the movement towards an OA system is, in our view, to a large extent simply replicating the existing dysfunctions of the subscription-based market, by having the major and dominant players systematically abusing the prestige-based career advancement system; it remains unclear whether these practices by the large publishers will continue unchecked with the recent unveiling of Plan S.

A lack of competition reduces innovation and increases costs to the taxpayer

One major consequence of Elsevier's dominant position (in conjunction with the few other major players with analogous financial interests) in this dysfunctional oligopoly is that a transition from a content-based organization that mainly benefits the corporations towards a service-based organisation that benefits everyone has yet to occur. On the edges of the scholarly communication landscape, starting in developing countries such as Brazil and other Latin American countries, service-based publishing organizations were established. First SciELO, now over 20 years ago, then others such as Ubiquity Press[32], Scholastica, Arpha

[30] Linking impact factor to 'open access' charges creates more inequality in academic publishing, Bianca Kramer and Jeroen Bosman, Times Higher Education. (Accessed 13/09/2018).
[31] Please note that a copy is also available via the Internet Archive. (Accessed 16/10/2018).
[32] Publishing with Ubiquity Press, Ubiquity Press. (Accessed 11/10/2018).

and others[33]. Others, such as the Journal of Machine Learning Research, are even more efficient with average article production costs of USD $6.50[34], so less than 0.5% of what Elsevier currently charge for an equivalent service. In contrast to the legacy publishers, whose revenue mainly derives from selling content, these organisations derive revenue by providing exchangeable services: if their customers such as scholarly societies publishing field-specific journals are not satisfied with their services, they can switch to a competitor. Comparing the per-article revenue of the two systems exemplifies both the potential for saving public funds and the main cause for the legacy publishers' resistance. While subscriptions (i.e., selling content) provide legacy publishers with approx. €3,800-5,000 revenue per article (Schimmer at al., 2015), the service-based organisations only receive around €400-500 per article in revenue. After a transition from a content-based to a service-based organization of scholarly communication, these costs can be assumed to come down even further, due to increased scale and innovation/efficiency due to competition (Bogic and Ballesteros, 2016). Thus, if such a transition were to take place, taxpayers would stand to see a more than 90% drop in the costs of scholarly communication while users were to enjoy increased value because of the increased innovation, openness and transparency.

The recent Springer Nature IPO prospectus exposes how other publishers also continue to view this situation. They state (Section 1.16, Risk Factors): "Compared to traditional publishers, open access publishers face lower barriers to entry. For example, pure open access market participants do not require a sizeable sales force. Furthermore, the technical equipment required for open access publishing, such as hardware and software, is becoming less expensive. While the offerings of new and smaller competitors may be of lower quality, an increase in these offerings may nevertheless lead to a reduction in demand for our subscription-based offerings. New competitors in the open access market may also gain market share, resulting in a weakening of our market position. Furthermore, increased competition in the open access market could put downward pressure on the APCs, thereby adversely affecting margins we earn in the open access business. If any of these risks were to materialize, our investments in the open access business model would not yield the expected returns, and our results could be materially adversely affected." Essentially, the way to interpret this is that Springer Nature see competition and innovation as a risk to their business model (which it is), and thus again reveal the view that they have very little incentive to let any fair market conditions arise due to the threats that this poses.

[33] How much should a scholarly article cost the taxpayer?, Björn Brembs. (Accessed 11/10/2018).
[34] An efficient journal, The Occasional Pamphlet. (Accessed 11/10/2018).

Strong corporate opposition thwarts current reform efforts

What this dysfunctional system creates is a cycle of journal lock-in, due to the persistence of this positional advantage and the increasing entrenchment of established publishers like Elsevier. Here, librarians and researchers must coordinate within this cycle in order to gain any sort of academic capital, which they achieve by continuing to perform the same actions as other groups. The UK's Office for Fair Trading recommended in 2002 several potential steps to take to improve competition without the need of regulatory intervention. This includes:

1. Price restraint from commercial publishers;
2. Increased buyer power;
3. Academic power;
4. The impact of new Web technologies.

For point 1, we have clearly not seen this, and the serials crisis continues unchecked, with Elsevier gaining higher revenues and profit margins than ever before; their latest financial report shows continued growth in publishing revenue and profits[35], despite the ongoing tensions with EU member states like Germany and Sweden. This indicates that even national level subscription cancellations have a negligible impact on Elsevier's revenue streams, and certainly there is no evidence to suggest influence on their business practices. For point 2, we are beginning to see the emergence of collective action in the form of academic and library negotiation consortia. However, the impact of these at the present remains minimal, and Elsevier continue to dominate the landscape in terms of 'big deals' for both subscription and OA licensing agreements. Furthermore, APCs and costs of journal subscriptions are still increasing faster than inflation, and Elsevier are still reporting increasing profit margins, and therefore buyer power seems to be having a negligible impact at the present; and it certainly does not seem to be helping to make the marketplace more accessible to newer entrants. For point 3, while there has been some anecdotal evidence of academics refusing to review, submit, or edit for journals, the impact of this again has been negligible due to the sheer size of Elsevier. If anything, for point 4, the dominance of Elsevier has stifled the application of new technologies in the scholarly publishing system. Well-established technologies in other industries such as machine learning, artificial intelligence, and social networks, are only in their infancy, while much

[35] RELX's first-half results ease concerns over German and Swedish universities dispute, ProactiveInvestors. (Accessed 30/07/2018).

of the core technologies are still based on archaic systems and vastly inefficient compared to the progress being made in other industries. Elsevier have also been clever to capture any emergent competitors in this domain, including data analytics providers, networking and preprint platforms, and other information handling systems, as part of its corporate restructuring into an analytics service provider. This not only stifles innovative competition, but also prevents them from growing further than the constraints of Elsevier's operational protocols, thereby reducing any impact emergent technologies could have on the scholarly publishing market.

Conclusions

We believe that the present scholarly communication market is clearly not functioning well due to a number of related reasons. High subscription charges still reign, publishers still offer limited access to research to the wider public, many continue to reap excessively high profits, and many financial elements of the process is shrouded in secrecy. Much of these peculiarities exist due to a combination of content aggregation and concentration by a few large players, chief among which is Elsevier, that each individual research article acts as a mini-monopoly meaning that consumers have no buyer power over content, and the use of non-disclosure clauses over licensing agreements which restricts any sort of competitive consumer power. These activities continue unrelenting, despite numerous warnings over the last several decades.

As such, the natural interventions that could have created a fair competition market for scholarly publishing have clearly not worked. The 2002 report by the OFT concluded that if competition in this sector fails to improve (see above points), or if additional significant information should come to light, then further regulatory action might be warranted on an international level. We believe that Elsevier and other major publishers are continuing to engage in anti-competitive practices, which are continuously worsening, and that information gained in the last 15 years urges immediate investigation and intervention into this unregulated market space. This could be, for example, through an empirical analysis of the scholarly publishing market; by having an independent regulatory body monitoring and overseeing the digital services provided by Elsevier and others within the industry; banning the use of non-disclosure clauses in licensing contracts; requiring transparency into the production costs of research articles and publishing operations; banning the use of inappropriate journal-level metrics in hiring, granting, and promotion decisions; abolishing copyright on journal articles; and encouraging the wider establishment

of library consortia to increase buyer power (and therefore simultaneously potentially reduce the monopoly power of publishers).

It is our view that action of this sort is clearly required in order to transform the present scholarly publishing sector into one characterised by sustainable service-based competitive market conditions, and this cannot be achieved without taking explicit measures against the business practices of Elsevier and other large publishers. We finish by noting that Plan S is a small and welcome step in this direction, but requires substantially more conviction if it is to lead to the functionality of a truly competitive scholarly publishing market.

Yours sincerely,

Dr. Jonathan Tennant, UK;

Prof. Dr. Björn Brembs, Germany

(All writing in a personal capacity)

Bibliography

Armstrong, M. (2015) Opening access to research, The Economic Journal, 125. https://doi.org/10.1111/ecoj.12254.

Björk, B.-C. (2017). Growth of Hybrid Open Access, 2009–2016. PeerJ 5, e3878. https://doi.org/10.7717/peerj.3878.

Björk, B.-C., and Solomon, D. (2014) Developing an Effective Market for Open Access Article Processing Charges. (Available online; https://fwf.ac.at/fileadmin/files/Dokumente/Downloads/Dev_Effective_Market_OA_Article_Processing_Charges.pdf).

Bogic, T. and Ballesteros, S. (2016) On the marginal cost of scholarly communication, https://doi.org/10.29016/bogich2016.

Eve, M. P. (2014) Open Access and the Humanities: Contexts, Controversies and the Future. Cambridge: Cambridge University Press. http://dx.doi.org/10.1017/CBO9781316161012.

Larivière, V., Haustein, S., and Mongeon, P. (2015) The oligopoly of academic publishers in the digital era. PLOS ONE, 10(6), e0127502. https://doi.org/10.1371/journal.pone.0127502.

Lawson, S. (2014) APC Pricing. https://doi.org/10.6084/m9.figshare.1056280.v3.

Lawson, S., Meghreblian, B., and Brook, M. (2015) Journal Subscription Costs - FOIs to UK Universities. Figshare. https://doi.org/10.6084/m9.figshare.1186832.v23.

Morrison, H. (2017) From the Field: Elsevier as an Open Access Publisher. The Charleston Advisor, 18(3), 53-59. https://doi.org/10.5260/chara.18.3.53.

Posada, A. and Chen, G. (2018) Inequality in Knowledge Production: The Integration of Academic Infrastructure by Big Publishers. Leslie Chan; Pierre Mounier. ELPUB 2018, June 2018, Toronto, Canada. <10.4000/proceedings.elpub.2018.30>. <hal-01816707>.

Roth, Dana L. (1990) The Serials Crisis Revisited. The Serials Librarian, 18(1–2), 123–29. https://doi.org/10.1300/J123v18n01_09.

Schimmer, R., Geschuhn, K. K., & Vogler, A. (2015). Disrupting the subscription journals' business model for the necessary large-scale transformation to open access. Doi: 10.17617/1.3. http://hdl.handle.net/11858/00-001M-0000-0026-C274-7.

Tennant, J. (2018). Complaint to the European Ombudsman about Elsevier and the Open Science Monitor. Zenodo. http://doi.org/10.5281/zenodo.1317961.

The Market for Scientific, Technical and Medical Journals: A Statement by the Office of Fair Trading (OFT 396), Interlending & Document Supply, 31 (2003), 61–64 (https://doi.org/10.1108/02641610310460745) (Available online; http://econ.ucsb.edu/~tedb/Journals/oft396.pdf).

Ware, M. and Mabe, M. (2015) The STM Report: An overview of scientific and scholarly journal publishing. International Association of Scientific, Technical and Medical Publishers. (Available online; https://www.stm-assoc.org/2015_02_20_STM_Report_2015.pdf).