

# 1. Introduction

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## 1.1 DEVELOPMENT OF THE ACADEMIC PUBLISHING MARKET AND THE SERIALS CRISIS

In most disciplines, scholarly journals have become the central medium of academic communication. Any academic library that aims to provide its users with the relevant research results of the international academic community and thereby to foster its reputation must invest considerable amounts to maintain an up-to-date stock of scholarly journals. The number of scholarly journals and the number of articles published each year have grown steadily. In 2014, about 28,100 active peer-reviewed English-language journals were available, plus another 6,450 journals in other languages, containing a total of about 2.5 million articles per year (STM Report 2015: 6). The largest share of these research papers originates from the US (about 23 percent of the global output), 17 percent are from China, which has experienced a dramatic growth in research output over the last 15 years, 7 percent from the UK, 6 percent each from Germany and Japan, and 4 percent from France (ibid.: 7).

Over the last 40 years, the market for scholarly journals has experienced a number of dramatic changes:

- Not least since the mass expansion of academic education not only in the Anglo-Saxon countries after World War II and the increasing size of faculty, publications in peer-reviewed, highly ranked journals have become an important precondition for academic careers in many disciplines.<sup>1</sup>
- Since then, the hitherto dominant publishers of such material – non-for-profit organizations, such as learned societies and universities – have increasingly ceded market shares to commercial publishers.
- Today's market for scholarly journals is characterized by a high degree of concentration. The five major commercial publishers – Elsevier,

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<sup>1</sup> See e.g. Willinsky (2009: 13–37).

Springer, Wiley, Taylor & Francis and SAGE – already cover more than half of the market for scholarly journals.<sup>2</sup> Since most journals, even within the same discipline, are not close substitutes but differ considerably with respect to their reputation with authors and readers, each journal constitutes a kind of ‘mini-monopoly’.<sup>3</sup>

- With the development of digitization and the advent of the internet, an increasing share of scholarly journals have become available electronically, some exclusively, some in addition to the print versions. Few journals remain available in print version only.<sup>4</sup>
- In particular, the ‘big five’ commercial publishers have increasingly replaced the traditional model of offering subscriptions to individual journals by so-called ‘big deals’, i.e. they sell bundles of content (print copies and licenses to access electronic journals) to (consortia of) academic libraries (Suber 2012: 32–33). Holding a sufficiently large portfolio of strong, highly ranked journals, this bundling enables publishers to urge libraries to subscribe also to less important journals, which further increases the publishers’ profits.

All of these developments have led to an enormous increase in journal prices over the last 30 years, placing substantial pressure on academic library budgets.<sup>5</sup> Facing sharply increasing serial unit cost and serial expenditures, libraries have had to allocate an increasing share of their budgets to scholarly journals, to the detriment of expenditures on monographs, which have stagnated. While the North-American research libraries spent about a third more on journals than on monographs in 1987, this ratio had risen to about four to one by 2011. This stagnation of

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<sup>2</sup> Larivière et al. (2015).

<sup>3</sup> ‘... high subscription fees and excess publisher profits are due mostly to the monopoly nature of each individual article, not to some more aggregated measure of concentration in the journal market’ (Armstrong 2015: F11). See also Suber (2012: 39).

<sup>4</sup> According to Prabha (2007), who collected data on 515 journals subscribed to by member libraries of the Association of Research Libraries, a non-for-profit organization of the leading research libraries in the US and Canada, within only four years (2002–06), the share of journals that are only available in print version dropped dramatically from 64 percent to 31 percent, while the share of journals only available in electronic version increased from 5 percent to 37 percent, and the share of journals available in both formats increased from 31 percent to 33 percent. Other studies, quoted in the STM report 2015, place the share of online-availability of scholarly journals in 2008 at 96 percent for Science, Technology and Medicine, and 87 percent for Arts, Humanities and Social Sciences.

<sup>5</sup> See also Ramello (2010).

monograph expenditure was felt in particular by the humanities, in which these types of publication are especially important.

## 1.2 COPYRIGHT PROTECTION IN ACADEMIC PUBLISHING

So far, the commercial publishers' business success has strongly depended on copyright protection. Copyright law covers works of literature, science and art, in other words the creation of specific information such as texts or sheet music. An essential property of that information is its lack of rivalry in consumption. One man's enjoyment of a text or song does not interfere with anyone else's desire to read the same text or listen to the same song. Nobel laureate Paul A. Samuelson introduced the term 'collective consumption goods' for such goods and he developed conditions for their optimal supply (Samuelson 1954).<sup>6</sup> By contrast, one person's use of a private consumption good, such as food, clothing or mobile phones, prejudices everyone else's use, so we have rivalry in consumption.

How, then, can we reconcile the non-rivalry of works of literature, science or art with exclusive property rights? This question is easily posed but much harder to answer. On the one hand, as soon as a work becomes a 'collective consumption good' and its use is non-rivalrous, the exclusion of interested parties from its use is almost impossible to justify on economic grounds. Every additional consumer draws a benefit from using the work without reducing the welfare of others. Hence, the admission of additional users constitutes a Pareto improvement; a restriction of access would imply a loss of welfare. At the same time, it must be noted that not only end-users consume the work. The creator herself will have been inspired to some extent by other existing works. With strong copyright, such inspiration

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<sup>6</sup> Some authors in this context speak of 'public goods', which are characterized by non-rivalry in consumption and the non-excludability of non-payers. This definition is due to Musgrave, who sought an economic rationale for the fact that goods such as a country's internal and external security are not supplied by the market but instead by the state, and that they are financed through compulsory levies. Like other rights to immaterial goods, however, copyright accomplishes exactly that excludability. Accordingly, Landes and Posner (2003: 14) remark on the concept of a public good: 'It sounds like a good produced by the government as opposed to the private sector. That is true of public goods that people cannot be excluded from having the benefit of even if they don't contribute to the cost of supplying the goods. The clearest example is national defense. Many public goods, however, including intellectual property, are excludable in the sense that it is possible to condition access to them on payment.'

would be less available, so the cost of creating new works would increase. On the other hand, works of literature, science and art are not created out of thin air; their production requires time, creativity and money. These are scarce resources, and creative individuals will only be prepared to invest in the creation of new works if the investment promises an adequate return.

In brief, copyright law is a method to induce the creation and dissemination of new information by restricting access to existing information. From an economic perspective, the debate on copyright in general, and on copyright in the age of digitization and the internet in particular, should thus focus on the optimal design of copyright rules: Sufficiently strong incentives should be established for the creation of works of literature, science and art, while at the same time society should not be burdened with unnecessarily high costs. The essential issue concerns the trade-off between underproduction of information, i.e. works of literature, science and art caused by insufficient protection of the creator, and the underuse of this information caused by overly strict exclusive property rights for the creator.

How are academic authors special? As Suber (2012: 129–30) correctly states, the conventional wisdom that authors need copyright to give them an incentive to write does not hold for authors of research articles – and this for two reasons: On the one hand, authors who submit articles to scholarly journals are not interested in royalties for these articles and they are usually not paid by the journal. Rather, they are interested in readership, citations and impact in order to increase their reputation.<sup>7</sup> On the other hand, scholarly authors typically transfer their copyrights exclusively to the publisher, to enable him to cover the cost of providing a number of valuable services, including (Armstrong 2015: F3):

- preparing the definite typeset version of an article,
- certifying an article's quality via the journal's reputation for selectivity,
- improving the original manuscript with suggestions from reviewers and editors, and
- distributing the published article to those (and only those) permitted to read it.

The crucial question is to what extent the publisher contributes to the value added of the creation and dissemination of research articles compared to the other participants, such as authors, editors and reviewers,

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<sup>7</sup> See also Shavell (2010: 10): '... the utility of academic authors is increased by the readership of their published works because they gain esteem from readership.'

who are typically paid by their universities (Suber 2012: 37), and to what extent publishers of research articles must be protected by copyright law to give them an incentive to provide the required services at reasonable cost. Digitization and the advent of the internet have at the same time dramatically lowered some publishing costs and also increased the journals' ability to generate revenues (for some details see Armstrong 2015: F9).

Let us examine the cost side first. The availability of word processing software has certainly reduced the journals' typesetting cost. Moreover, editorial software reduces the cost of managing the submission and peer-review process. Less clear is the impact of the internet on the second type of publisher's services, the certification of the quality of an article. An academic article is an experience good. Time and effort are required to read an article and to 'experience' its quality.<sup>8</sup> The fact that an article is published by a highly reputed journal following an intensive review process provides valuable *ex ante* quality information to the reader. At the same time, authors will benefit from this quality signal to the extent that their reputation and career depend on publications in highly ranked journals. The internet may reduce the benefit of quality certification by journals in the future as citation and download data for individual articles (e.g. via Google Scholar) and even comments on individual papers are becoming available. The net benefit of the third function of traditional journals – improving the manuscript by suggestions from reviewers and editors – is ambiguous. On the one hand, both authors and readers benefit from improved quality. On the other hand, this benefit comes at a cost, since authors must spend time and effort to cope with the reviewers' sometimes conflicting recommendations and readers have to wait a long time for a submitted paper to be published. Finally, the dissemination of the articles via the internet occurs at zero marginal cost.

However, not only have the costs of the publishers' services declined, but their ability to create revenues has indeed increased. Thanks to the electronic dissemination of the articles, publishers can monitor download activity and fine-tune their prices accordingly (Armstrong 2015: F9). Moreover, copyright protection enables publishers to restrict access to electronic journals in a way 'that leaves users with fewer rights than they had with print journals', adding 'a permission crisis on top of the pricing crisis' (Suber 2012: 34).

Thus, the advent of modern software and the internet has, on the one hand, reduced the cost of producing, selecting, editing and disseminating

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<sup>8</sup> Nelson (1970) contrasted experience goods with search goods, where only the latter's quality can easily be observed before purchase.

research articles. On the other hand, the existing copyright law enables publishers to restrict access to these electronic articles far beyond what is possible in the case of print editions. Therefore, it comes as no surprise that the advent of the internet has triggered critical discussions about the role of copyright law under these new conditions.<sup>9</sup> The discussion already began in the 1980s, when Richard M. Stallman, a software developer at the MIT, criticized the restricted access to computer operating systems. In 1989, he devised a new type of license, the GNU Public License (GPL), which is completely different from traditional software licenses, applying an alternative approach to the use of copyright without denying the original creator's copyright protection. Instead of using the copyright protection of software to restrict the end-user's freedom to modify the underlying source code and/or to redistribute the program, Stallman made access to the source code public and allowed the users to view, redistribute and, most importantly, modify the program, where any modification to the software must be redistributed on the same terms (Eve, 2014: 17).<sup>10</sup> Based on this principle, Harvard legal scholar Lawrence Lessig in 2001 founded the non-for-profit organization 'Creative Commons', which offers a set of licenses that 'are designed to allow others to redistribute, modify, translate and computationally analyze works', with different levels of permissiveness (Eve 2014: 20).

### 1.3 THE ORIGINS OF OPEN ACCESS IN ACADEMIC PUBLISHING

The development of digitization, the advent of the internet and the discontent with the existing price barriers and technical barriers to the access to research articles induced many scholars, initially in the US, to support open access to these articles. Several initiatives sought either of two roads to open access: (1) *gold open access*, i.e. the establishment of electronic journals with open access for all readers, often based on creative common licenses; the journals' costs are covered not by submission fees but from other sources, such as authors' fees or subsidies from learned societies or research sponsors; and (2) *green open access*, i.e. the establishment of so-called open access repositories that enable scholarly authors to upload (or self-archive) their papers, either independently of, prior to, or after publication in traditional journals.

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<sup>9</sup> See, for example, the discussion in Eve (2014: 16–21).

<sup>10</sup> As a wordplay, Stallman coined the concept of 'copyleft'.

An early active promoter of open access in the US was cognitive scientist Stevan Harnad. Already in 1989, he launched the free online journal *Psychology* and later supported the self-archiving of research articles. In the Overture to his 'Subversive Proposal' (1994) he stated:

For centuries, it was only out of reluctant necessity that authors of esoteric publications made the Faustian bargain to allow a price-tag to be erected as a barrier between their work and its (tiny) intended readership because that was the only way to make their work public in the era when paper publication (and its substantial real expenses) were the only way to do so.<sup>11</sup>

In 1997, he launched the repository 'cogprints', which specializes in psychology, neuroscience, linguistics and computer science. Already in 1991, physicist Paul Ginsparg had established arXiv, an open access repository for papers in physics, mathematics, computer science, quantitative biology, quantitative finance and statistics, and in 1994, Wayne Marr and Michael Jensen launched another important open access repository, the 'social science research network' (SSRN), which was acquired by Elsevier in 2016. In the last decade of the 20th century, more open access journals and repositories were launched in particular in the US, and many universities established open digital archives.

The evolution of open access subsequently spread beyond the US. The most impressive example is the establishment of SciELO ('Scientific Electronic Library Online'), which was established in 1997 in Brazil and today covers most Latin American countries, South Africa, Spain and Portugal. Another example is the Hindawi Publishing Corporation, which was founded in Cairo in 1997. Originally established as a traditional publisher of academic journals, Hindawi soon began to publish selected journals in open access mode and eventually dropped publication based on subscription fees altogether in 2007. As of 2016, their portfolio comprises more than 400 peer-reviewed academic journals. Finally, Medknow Publications, founded in 1997 in Mumbai, specializes in scholarly journals in medicine and natural science. At the turn of the millennium, Medknow converted most of their journals to open access. They were acquired by Wolters Kluwer Health in 2011 and, as of 2016, have 372 journals in their portfolio.

In the early 2000s, academic scholars, representatives of research libraries and research sponsors from all over the world launched several initiatives to foster open access to scholarly articles, including

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<sup>11</sup> Available at [https://groups.google.com/forum/?hl=en#!topic/bit.listserv.vpie-j-l/BoKENhK0\\_00](https://groups.google.com/forum/?hl=en#!topic/bit.listserv.vpie-j-l/BoKENhK0_00).

the 'Budapest Open Access Initiative'<sup>12</sup> (February 2002), the 'Bethesda Statement on Open Access Publishing'<sup>13</sup> (June 2003), and the 'Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities'<sup>14</sup> (October 2003).

The Budapest Open Access Initiative defines open access as follows:<sup>15</sup>

By 'open access' to this literature, we mean its free availability on the public internet, permitting any users to read, download, copy, distribute, print, search, or link to the full texts of these articles, crawl them for indexing, pass them as data to software, or use them for any other lawful purpose, without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself. The only constraint on reproduction and distribution, and the only role for copyright in this domain, should be to give authors control over the integrity of their work and the right to be properly acknowledged and cited.

The Berlin Declaration contains the following, almost identical condensed form (which is also very similar to the formulation in the Bethesda Statement):

The author(s) and right holder(s) of such contributions grant(s) to all users a free, irrevocable, worldwide, (perpetual) 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.

These statements and declarations triggered a boom of open access activities, also in Europe. Manifold bottom-up initiatives by academic libraries, research sponsors and individual activists developed, research sponsors supported gold and/or green access by open access mandates, and in some countries, open access was even promoted by new legislation. These initiatives and policies will be the subject of our more detailed discussions throughout this book.

In the following, we start with an extensive presentation of how the academic publishing market has developed over time (chapter 2). In this chapter, we not only discuss the specific reward structure faced by authors of scholarly articles in different disciplines but we also explore

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<sup>12</sup> [www.soros.org/openaccess/read](http://www.soros.org/openaccess/read).

<sup>13</sup> [www.earlham.edu/~peters/fos/bethesda.htm](http://www.earlham.edu/~peters/fos/bethesda.htm).

<sup>14</sup> <https://openaccess.mpg.de/Berlin-Declaration>.

<sup>15</sup> The principal drafter was Peter Suber, currently the Director of the Office for Scholarly Communication at Harvard University and a very active supporter of open access.

important features of the supply and the demand side of the scholarly journals publishing market. Moreover, we elaborate on the development of gold and green open access (OA) and their political support in selected countries. Having discussed important *objective data* on OA, in chapter 3 we evaluate the results of an international survey we conducted between 2012 and 2015 in 25 countries. This chapter provides some insights on the experiences of scholarly authors with and their attitudes towards OA, and complements chapter 2 by providing the corresponding *subjective data*. Based on these results, chapter 4 analyzes the reasons for the success (or lack thereof) of recent policy attempts to foster OA in academic publishing. Chapter 5 summarizes the most important results and concludes with some more general insights regarding the future of academic publishing. The appendix (chapter 6) provides some additional information on the tables and figures used in the text.