

LET'S NOT SEE OPEN ACCESS AS A THREAT:  
CONVERGENCE AND DIVERGENCE AMONG RESEARCH LIBRARIANS AND  
ACADEMIC PUBLISHERS ON PUBLIC ACCESS TO THE SCHOLARLY LITERATURE

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KAMRAN NAIM

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**John Willinsky, Primary Adviser**

I certify that I have read this dissertation and that, in my opinion, it is fully adequate in scope and quality as a dissertation for the degree of Doctor of Philosophy.

**Anthony Antonio**

I certify that I have read this dissertation and that, in my opinion, it is fully adequate in scope and quality as a dissertation for the degree of Doctor of Philosophy.

**David Labaree**

Approved for the Stanford University Committee on Graduate Studies.

**Patricia J. Gumport, Vice Provost for Graduate Education**

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## **Abstract**

The now widespread recognition of the benefits of open access (OA) to research and scholarship has brought the global system of scholarly publishing to a historic turning point, as well as an impasse as the key stakeholders differ on how best to achieve the goal of universal OA. This thesis builds on quantitative work measuring the progress of OA by analyzing the positions and values of research librarians and scholarly publishers around this topic. Utilizing a survey of librarians ( $n = 188$ ) and interviews with commercial and nonprofit publishers ( $n = 20$ ), participants were asked to respond to a model of OA involving “subscription-equivalent transition” in terms of library costs, to solicit what was valued and what was most concerning. It was found that librarians and nonprofit publishers generally agreed that OA is integral to the future of scholarship; which was not the case among commercial publishers, who were qualified in their support, to the point of seeing it as potentially detrimental to scholarly publishing. Both sets of stakeholders recognized the dangers posed by library free ridership under OA publishing models. Librarians viewed subscription-equivalent arrangements more favorably than other dominant OA models. Both commercial and non-commercial publishers considered the subscription-equivalent model not an attractive option, but with varying justifications: nonprofits perceived greater risk due to their smaller market share, while commercial publishers sought to preserve their profit-making and growth imperatives. Librarians and publishers were mixed in their perceptions of the prevailing article processing charges (APC) model: it was recognized among some librarians as a viable transition path for some disciplines, and by others as inefficient and unscalable. Some publishers saw APCs as desirable an OA for providing authors with a choice. These results suggest, in the short term, opportunities for cooperation between librarians and nonprofit publishers to engage in cooperative models—that leverage mission

alignment, financial transparency, and assurance contracts to sustain revenues—to transition from selling content to OA publishing service models. Despite findings of damaged trust between both parties, librarians indicated their willingness to enter into financially neutral models. Rather than seeing OA as a threat, the vastly greater potential for open science to address global issues suggests we are at a historic moment: where, through mutual compromise and reconciliation, we may achieve a digital information commons through cooperation.

## **Acknowledgments**

In one of the few truly serendipitous moments of my life, in June of 2012 I found myself at a symposium at Pembroke College at Oxford University, where Professor John Willinsky stepped up to deliver a keynote presentation. In his inimitable style—white shirt, quick wit, dry sense of humor and not a single PowerPoint slide in sight—he delivered a talk that was as funny as it was provocative. Over the course of the next fifteen minutes, he made me completely rethink my approach to my work on promoting global equity in access to research information. In an uncharacteristic moment of bravery, as if propelled by destiny, I asked if he could spare some time for an exchange of ideas. A few hours and a couple of glasses of wine later, the journey to this moment began. In the years since we have worked together on research projects, taught multiple cohorts of large undergraduate STS1 classes, and helped support the most humbly brilliant cohort of students in the undergraduate Honors in Education program, all while grappling with solutions to solve some of the systemic problems that plague the world of scholarly communications. I have struggled all this time to contain my admiration for his brilliance, kindness and generosity of spirit. Here I have a moment to say, simply, that working with John Willinsky has been, without question, the privilege of a lifetime—one for which I will remain eternally grateful.

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## **Stealing the Common from the Goose**

The law locks up the man or woman  
Who steals the goose from off the common  
But leaves the greater villain loose  
Who steals the common from off the goose

The law demands that we atone  
When we take things we do not own  
But leaves the lords and ladies fine  
Who take things that are yours and mine

The poor and wretched don't escape  
If they conspire the law to break  
This must be so but they endure  
Those who conspire to make the law

The law locks up the man or woman  
Who steals the goose from off the common  
And geese will still a common lack  
Till they go and steal it back

[Seventeenth-century protest song against English enclosures]



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## Chapter 1

### 1.1. Introduction

In March of 2019, the University of California (UC) system—the largest public university system in the United States—announced that it would be cancelling its contract with the academic publishing giant Elsevier. Following a prolonged period of intense negotiations with failure to reach an agreement, the students, researchers, and faculty of the UC—who account for almost 10% of the research output of the United States—have lost access to Elsevier’s online platform of journals, and the commercial publishing giant has lost a contract worth an estimated US\$ 11 million. The UC’s cancellation of its deal with one of the world’s largest providers of scholarly content might appear at first to run counter to the values of university libraries, who have traditionally procured and curated collections of academic resources to serve the needs of their patrons. But the decision by the UC is driven by principle: that the work of their scholars should be made freely available and published open access (OA), and that the costs of scholarly journals—which have continued to climb at rates that far outpace the budgets of institutional libraries and have resulted in record profits for commercial publishers—be commensurate with the value provided by publishers.

Dramatic as this conflict between two of the heavyweights in global scholarship may be, it is hardly an isolated incident. Other major research organizations around the world—primarily driven by institutions and consortia in Europe—have taken positions similar to that of the UC, and have set up a global standoff between two of the major stakeholders in the scholarly communications system: academic libraries and scholarly publishers. This standoff is a consequence of the erosion of the relationship between these two stakeholders, prompted by the

increased dissatisfaction of librarians with the subscription-based pricing model. This model — which has supported scholarly publishing since the birth of the modern academic journal in the late seventeenth century — maintains its dominant hold, with an estimated 72% of the world’s scholarship remaining sequestered behind a paywall (Piwowar et al., 2018).

The discontent of librarians also stems increased degrees of commercialization and enclosure of scholarly content, specifically during a period of transformation to digital publishing where savings should have accrued in the production and dissemination of scholarly works.. The age-old scholarly values of academia—that knowledge belongs in an intellectual commons—have been co-opted by a handful of commercial publishing houses that exert excessive market power. For academic libraries, the profit maximizing practices of commercial publishers have resulted in significant pressure on institutional resources, and increased unaffordability of access to scholarship. This situation—described by librarians as “the serials crisis”—has diminished their ability to continue to fulfill their role as custodians of the intellectual commons.

Academic publishers, however, face pressures of a different nature. Their subscription-based model has in recent years been challenged by the OA movement, which argues that research outputs are a public good and should be freely available to all. With broad support growing across the scholarly community from scholars, libraries, and research funders (including most recently a group of major science-funding agencies identifying themselves as *cOAlition S*), academic publishing houses have increasingly adopted OA business models, including, perhaps somewhat paradoxically, the world’s largest commercial publishers. The groundswell of support for OA across all major stakeholders represents a recognition of the opportunity for digital technologies to revolutionize not only the dissemination and distribution of scholarship through



OA, but also the very nature of the scholarly enterprise to a more open, vibrant, and dynamic ecosystem. The embrace of OA has resulted in a dramatic growth since the formal inception of the movement in 2002. According to the most recent report, OA accounted for 41% of scholarship in 2017, although this figure includes OA-licensed final versions of research papers as well as other legally free versions of papers, including preprints (van Noorden, 2019). Other studies place the proportion of recently published literature at 50% (Jamali & Nabavi, 2015; Piwowar et al., 2017), in what represents, according to one study, “a tipping point” after which the progress of OA is likely to accelerate (Archambault et al., 2014).

There are other major forces pressuring the publishing industry to transition from the proprietary subscription model. The most acute challenge comes from the pirate website Sci-Hub, which has disrupted the industry with the technical sophistication of a Silicon Valley start-up. Founded in 2011, Sci-Hub provides instant, free access to more than two-thirds of all scholarly articles ever published, and 85% of all papers published behind the paywall of subscription journals (Himmelstein, Romero, McLaughlin, Greshake & Greene, 2018). The scope and size of Sci-Hub is undoubtedly a challenge for the majority of scholarly publishers, undermining their predominantly subscription-based business models by offering researchers a free, albeit illegal, path to accessing content. Sci-Hub is an acute indicator that the subscription-publishing model, on which the scholarly publishing industry has relied for its history spanning the past three and a half centuries, is becoming untenable.

Another challenge comes from the increased proliferation of online preprint databases, where authors are placing free copies of their manuscripts. Although the majority of these papers lack the value added elements provided by publishers—including peer review—advocates for

preprints contend that they deliver a net benefit to the system of scholarly communications (Speidel & Spitzer, 2018).

The challenges to the subscription pricing model—from the OA movement that is presenting successful models for the open dissemination of scholarly content, to the spectre of digital piracy of Sci-Hub that undermines the market power of commercial publishers, to the increasingly popular culture of scientific preprints—place the venerable institution of scholarly publishing at a moment of crisis. While the challenges affecting the system of global scholarly communication affect all the stakeholders in scholarly publishing, including researchers, students, societies, research-dependent industries, and NGOs, this thesis focuses on how two of the players at the frontlines of the conflict over the transition to OA, research librarians and publishers (including commercial and nonprofit publishers), are responding to, and making sense of, the changes underway within scholarly communications.

For much of the history of scholarly publishing, these two principal stakeholders have worked in close partnership to support the research process; their common mission being “to foster access to the world’s knowledge across disciplinary, institutional, and national boundaries for researchers, students, and academics alike” (Rossiter, 2016). But the commodification of academic journals by publishers during times of financial decline for academic libraries has created an increasingly adversarial relationship. Publishers continue to defend their business models, which include OA strategies and increasing expenses of publishing and dissemination. Librarians, however contend that publisher pricing has far outstripped their budgets and has negatively affected their ability to deliver services to their patrons.

Given the broad global acceptance of the importance of OA, this thesis provides a richer understanding of the positions of academic librarians and scholarly publishers as they navigate

the implications of the seemingly inexorable transition to OA-based business models. It presents specific points of agreement, as well as issues where there is no such agreement between the two stakeholder groups. Based on these findings, it provides guidance to librarians and publishers to restore the spirit of partnership and facilitate cooperation in a historic balance of academic and commercial interests that can inform the shape and nature of a system that would best serve research and scholarship for the digital era.

## 1.2. The Political Economy of the University and Scholarly Publishing

The notion that scholarly publishing would be associated with commercial activity would seem counterintuitive, or perhaps distasteful, to those who are aware of the age-old mandate of academia “to promote knowledge for knowledge’s sake” (Lawton-Smith, 2006). Since their inception, scholarly journals have served the purpose to advance society through the distribution of knowledge. As I describe in Section 1.4., the values of the free communication of scientific knowledge predate the birth of the scholarly journal itself, and have roots in ancient and medieval civilizations.

Communal academic values—such as peer-evaluated merit and assessments of contribution to knowledge—have fueled scholarship throughout its history. These values further advance the notion that for scholarship to operate optimally, researchers require free access to the outputs of research (Kranich, 2006). Given the specialist nature—and thus limited market—of academic publishing and the liberal academic imperative of advancing knowledge, academic journals would ideally reflect the values of the process of knowledge production in universities and be protected from extraneous forces such as commercial influence.

However, as contemporary social theorists have shown, academic knowledge production does not exist in isolation, and generally reflects the larger economic system in which it is

situated. Most famously, in *The Postmodern Condition: A Report on Knowledge*, Jean-Francois Lyotard claims that knowledge in contemporary society flows according to an economic logic:

The relationship of suppliers and users of knowledge to the knowledge they supply and use is now tending and will increasingly tend, to assume the form already taken by the relationship of commodity producers and consumers to the commodities they produce and consume - that is, the form of value. Knowledge is and will be produced in order to be sold, it is and will be consumed in order to be valorized in a new production: in both cases the goal is exchange. Knowledge ceases to be an end in itself.... (Lyotard, 1984, p. 4).

The commodification of knowledge, that is, the conversion of academic knowledge into a product sold for profit at the expense of the producer, is considered thus as a necessary consequence of the socioeconomic system in which knowledge circulates. According to Nico Stehr in *Knowledge Societies*, the inevitable consequence of the commodification of knowledge is an inherent aspect of the shift of production from manual labor to intellectual labor where a significant part of society lives off the selling of knowledge:

It would appear to be almost self-evident that, in a society in which knowledge becomes the dominant productive force, that knowledge, or certain types of knowledge at least, turns into a commodity and can be appropriated, recognized and treated as property. Of course knowledge has always had its price and has never been available in an unlimited supply, that is, knowledge has been not unlike other commodities, scarce, and in order to utilize it, one had to sometimes buy it. (Stehr, 1994, p. 109)

Drawing from these theorists, it would be impossible to conceive of any form of production to occur in isolation from greater economic and social forces. Thinking of academic knowledge as

being increasingly commodified is thus not an exception but rather proves the rule of the encroachment of the economic into every social sphere and the commodification of everyday life (Gottdiener, 1994). The university's inevitable situation in a dominant capitalist marketplace leaves it susceptible to the intrusion of economic values into the academic sphere. Thus the only way to understand the contemporary situation of academia is to fully incorporate an analysis of some of the external features of knowledge production such as the economic and political climate, the marketplace, and consumption (factors termed here as the “political economy”).

In opening the economic “blackbox” of academic knowledge by examining the political economy of scholarly publishing from the perspective of librarian and publisher, we find these two parties making their way within the ideological practice of academic liberalism while staving off or embracing the forces of capitalism. At the heart of academic economies is scholarly publishing and the exchange and distribution of scholarly knowledge. Thus, the tension between commodification of scholarly knowledge and liberal academic values that argue that knowledge belongs in a scholarly commons is not distinct. Rather it is emblematic of the encroachment of economic values of privatization that has become a defining feature of higher education in the latter twentieth century. At the frontlines of this tension between the communal values of liberal academia and the commercial values of the capitalist market economy, respectively, are academic libraries and scholarly publishers.

### 1.3. The Frontlines of Scholarly Publishing

Throughout history, libraries have served as custodians of the knowledge commons, playing critical roles as stewards and archivers of information goods (Kranich, 2006; Lougee, 2007). In service to the academic community, research libraries have been committed to subscribing to journals since their inception; often the collections of journals available at a university research

library reflects the prestige of the institution as a “research university.” Academic libraries, i.e. those at universities, colleges, or private educational institutions face challenges of maintaining access to content and delivering adequate services to their patrons during a period of financial austerity and dramatic transformations in scholarly publishing.

These changes, propelled by the rise of digital technologies are recasting the role of libraries, “from [their] role as a knowledge service provider within the university to become a collaborative partner within a rich and diverse learning and research ecosystem” (ARL, 2014). Academic libraries are more meaningfully engaged as agents in the research process to support the underlying mission of academic institutions in supporting the creation and distribution of knowledge (Lougee, 2009. p.4.).

True to their communal spirit, research libraries have become collaborators and catalysts within the academy. They have organized themselves into consortia to use their consolidated purchasing power as leverage in pricing negotiations with publishers. Some are participating in collective funding approaches that seek to underwrite the costs of OA publishing for academic journals and scholarly monographs, and some libraries are entering into coalitions to take on the role of publishers and facilitate the production and hosting of scholarly journals. Academic libraries are increasingly appointing Scholarly Communications Librarians, specialist positions for expert library practitioners to lead and develop initiatives and services to support research communication (Bonn, 2014).

Academic journal publishing dates back to 1665 when the *Journal des Sçavans* in Paris and the *Philosophical Transactions of the Royal Society* in London were first published (Meadows, 1998), establishing the scientific journal as the principal medium for the communication of research (Oppenheim, Greenhalgh & Rowland, 2000). Both journals were

supported by state-funded scholarly associations, which meant the publications were construed as public goods rather than as commodities (Nentwich, 2001). Scholarly publishing has since proliferated, consisting of independent, society, and commercial publishers (Willinsky, 2005). For the first two and a half centuries of scholarly publishing, societies and university presses struck a balance with commerce, out of necessity rather than any particular commercial motive, to support the costs of production and their liberal missions to advance the body of knowledge in their respective disciplines.

As I describe in Section 1.4., it was not until the post–World War II period’s massive investments in higher education and research that scholarship began to be commodified and the scales began to tip in favor of commerce. Commercial publishing conglomerates recognized economic opportunities in the scholarly publishing market and began to implement strategies to launch new journals, acquire smaller society journals, and consolidate their positions with strategic mergers. This, combined with publishers successfully exploiting the opportunities of the digital revolution, have resulted in the polarized situation in which the publishing industry finds itself today. The largest of the commercial and society publishers control more than 70% of the journal market and have exercised oligopolistic control, increasing the costs of academic journals at rates that far exceed inflation. As a result, academic libraries are experiencing budgetary crises, and are struggling to meet the information needs of their patrons. With their monopolistic control on many of the journals that the academic community considers indispensable, the larger commercial and society publishers have been able to secure the lion’s share of academic library budgets. This situation has left the many thousands of smaller society and independent, nonprofit academic publishers to compete for the remainder of library budgets, or to relent and be acquired by larger commercial publishing conglomerates.

Academic publishers have justified their pricing for journal articles based on the rising costs of doing business, particularly relating to product and service development in digital publishing (STM Association, 2015). Publishers have further argued that the internationalization of the scientific enterprise has placed a greater burden of cost upon them: “the costs of scientific publishing are increasing worldwide, driven by the expansion of content, which includes more contributions from the developing world” (McNutt, 2016).

#### 1.4. Communal Versus Commerce in the History of Publishing

By reviewing the history of the balance between the communal values of academia embodied by academic libraries and the commercial values of the political economy in which academic institutions operate, we can arrive at a better understanding of how scholarly publishing has reached this pivotal moment.

##### 1.4.1. *Scientia donum dei est, unde vendi non potest*

Debates relating to the future of the scholarly communications enterprise have cast OA as a modern challenge, related to the paradigmatic shift from print to digital publishing. Yet, the idea of OA and the values of free access and open dissemination of scholarly works have deep historical roots (Peifer, 2008). In most premodern civilizations there was a “striking absence of any notions of human ownership of their ideas and their expressions” (Hesse, 2002). Knowledge was not regarded as an ownable commodity (May & Sell, 2006). In a response to the economic, political and cultural demand for higher forms of education in Ancient Greece in the second half of the fifth century B.C.E, the Sophists, were professional educators and intellectuals who were the first recorded to have taught for remuneration, the fact of which was objected to by many (Blank, 1986). These values are reflected in a well-known story where one of Plato’s students,



Hermodoros of Syracuse, was reported to have made written copies of his instructor's lectures and sold them for a profit in Sicily (Mure, 1854). The act of distributing Plato's works for material gain was considered contemptible in the ancient world, giving rise to the proverbial phrase, "Hermodoros trades in tracts," quoted by Cicero in a letter to Atticus about the circulation of his own writings (Bailey, 1968).

The Greek ideal of openness of knowledge continued through medieval times, where scribed writings were, for the most part, distributed free of charge. The same values were upheld for universities and professors. Instead, gifts were offered as recompense for the transfer of knowledge, as late as the sixteenth century. When universities began to take on the roles of custodians (and hubs) of knowledge once held by monasteries, they maintained open policies toward intellectual resources, with university policies prohibiting property rights over written texts (May & Sell, 1999). Even following the rise of commercial publishing houses, or *scritoria* at the time, universities continued to recognize that knowledge should not be sold for a profit, and carefully regulated the sale and loaning of written texts. Where fees were charged, they were levied out of necessity rather than any commercial gain; to cover costs to further enable open distribution of knowledge in the form of the printed word (Davis, 1983).

In 1508, the Dutch Renaissance humanist, scholar, and theologian Erasmus of Rotterdam started his collection of *Adages* with "*amicorum communia omnia*," or "friends hold all things in common," evoking the traditions of sharing and openness of scholarship (Barker, 2001; Eden, 2008). Inspired by him, and the ancient values of knowledge belonging in a commons, university presses were first established to promote the availability of scholarship, rather than for any monetary gain (Nentwich, 2001).

#### 1.4.2. The University Press

In July of 1534, King Henry VIII issued a letters patent to the University of Cambridge, granting it the right to appoint three printers who could print “all manner of books.” Issued in response to a petition from the university to the King to grant them powers “for the suppression of error”—with the underlying objective to meet concerns for the suppression of heresy—the letters patent afforded the university press a special status, distinct from the world of commerce. The patent effectively became the founding document of Cambridge University Press, establishing its position and role within the life of the university.

But the founding of the university press was not met without controversy or conflict. The press entered into a publishing market that was under monopolistic control by The Stationers’ Company of London. This monopoly, enabled by granting of a royal charter by Queen Mary in 1554 gave exclusive rights of book printing to the London-based Stationer’s Company printhouses. Under Elizabeth I, these restrictions were loosened to expand the rights of printing beyond London to include Oxford and Cambridge. Although this legislation granted special consideration to the scholarly centers of Oxford and Cambridge as centers of knowledge, to be economically viable the university presses needed to contend with the commercial control of the market by the Stationers’ Company:

While this measure seemed to set up a neat divide between commerce and learning, between the commercial press in the country’s center and the learned presses on the periphery, this was not the same as the founding of the monastery on the hill removed from the village. There was too much capital involved in running a press. A learned press had to be no less of a business proposition. Printers who sought to serve the universities

had to find ways to sell books in the broader market dominated by the London's Stationers' Company. (Willinsky, 2018, p. 255)

In the early 1630s, Archbishop Laud, Chancellor of the University of Oxford envisaged the establishment of an independent press at the university: one which would have the right to print books, and allow the university to benefit from the revenue it generated. Laud submitted a petition to King Charles I for printing rights that would allow the university to be competitive with the Stationers' Company and the Kings Printer. These rights were duly recognized and granted in the *Great Charter*, granting the university the right to print books, and in particular the exclusive privilege to print the King James Bible at Oxford, which although held in abeyance, generated significant returns for the press for the next 250 years (Carter, 1975, p.17).

Despite the special status afforded by the granting of the royal charters, the presses' entry into the monopoly-dominated publishing market required reconciliation or balancing with the scholarly values underlying their institutional missions. The relationship between commercial publishers and university presses was not characterized by cooperation, instead: "[a]s it became clear that printing was increasingly integral to the advancement of learning in the universities, leaders at these institutions began to seek and rigorously defend their printing rights and privileges, which led to decades, nay centuries, of commercial and legal contest over whose privileges would triumph" (Willinsky, 2018, p.257).

To secure the financial viability of Oxford's press, Laud negotiated *Covenants of Forbearance* with the Stationers' Company. These forbearance agreements involved the payment of an annual fee from the commercial Stationers' company to the university, under which the university agreed not to exercise all of its printing privileges granted under the royal Charter. These funds were utilized by Oxford University press to support the expenses of

printing scholarly works. Laud further introduced institutional statutes (known as the Laudian Code) to direct any surpluses in the building and maintenance fund that were generated from student fees to support the university's press (Willinsky, 2018, p.260).

Archbishop Laud's vision to establish a fully functioning press at the University of Oxford within his lifetime was not realized; he was jailed for treason in 1640, and executed by bill of attainder in 1645. Laud's model of the university press was effectively suspended until the Restoration of the Monarchy in 1660 (Carter, 1975, p.19).

It was not until the appointment of John Fell, Dean of Christ's Church College in 1662 as a delegate to the university press, that it began to take on a new life. Determined to honor Laud's vision of the Press, Fell convinced the university to refuse additional payments from the London commercial printers. He consolidated all of the printing activities from around the university to its physical center—at the Sheldonian Theater designed by Sir Christopher Wren—a symbolic statement of the importance of scholarly works being at the heart of the university (Willinsky, 2018, p.261). With donations from benefactors and the support of Sir Leoline Jenkins, Principal of Jesus College, and Thomas Yates, Principal of Brasenose College, Fell was able to secure printing rights from the university in 1672 (Barker, 1978, p.15). While continuing to trade in the exclusive privileges granted to the Press, Fell embarked on an ambitious plan to print learned and religious texts, but also some commercially popular content, most notably the *Oxford Almanack*—which continues to be printed annually to this day (Barker, 1978, p.22). The resulting commercial success of Fell's printing strategy allowed the further subsidization of printing of learned texts and diversification of the press's portfolio. In 1675, Oxford's press printed an edited version of the King James Bible, the *Fell and Yates Bible*, provoking a legal battle with the Stationer's company. Fell leased the Press's printing rights for the bible to three

rogue Stationers, whose business acumen led to the financial success of the Press' Bible and supported the continued production of scholarly works (Barker, 1978, p.22).

Similar to Henry Oldenburg's use of the commercially printed pamphlet to advance the communication of scholarly work through the *Transactions of the Royal Society*, Laud and Fell were able to navigate the constraints of the political economy of the time—characterized by monopolies enabled by royal patronage and market capitalism—to devise innovative ways to sustain their Press' role in communicating academic knowledge.

#### 1.4.3. The Bodleian Library

Despite an earlier history dating back centuries and a prolonged period of decline, the Bodleian Library at Oxford University as it endures today was founded in 1602 with an endowment from Thomas Bodley, a wealthy former fellow of Merton College, who insisted that the library be open to the public. In 1605 the English philosopher and statesman, Francis Bacon described the Bodleian as "an Ark to save learning from deluge" (Clapinson, 2015). Bodley further secured the status of the Bodleian as an archive of every published work in the United Kingdom, negotiating a deal with the Stationers' Company in 1610 to ensure one copy of every published book was deposited to the library (Jackson, 1969). This status for the library endures to this day, with its designation under the Legal Deposit Libraries Act 2003. Even in the early seventeenth century, the library had to balance its archival and access missions with a commercial model to support the library's expenses; users of the Bodleian Library in 1620 had to purchase a copy of the library catalogue at a cost of 2 shillings and 8 pence (Jackson, 1969).

#### 1.4.4. The Royal Society

Similar to Francis Bacon, post-Renaissance scholarship was primarily conducted by affluent gentlemen, pursuing their interests alongside their daily professional pursuits. In the mid-seventeenth century, these scholars began to coalesce into formal scholarly societies in major cities. Scientific communication between these scholars was restricted to the exchange and circulation of letters within these communities.

The Royal Society began as a group of some twelve scholars—including Sir Christopher Wren and Robert Boyle—who met regularly in London from 1645 onward, forging a “College for the Promotion of Physico-Mathematical Experimental Learning.” This group was granted a royal charter by King Charles II in 1662 for “the improvement of natural knowledge,” with Henry Oldenburg serving as the Society’s first secretary (Guédon, 2001). It was from these scholarly societies that the first academic journals arose to provide a more structured form of scholarly communication, which prior to the introduction of the journal were confined to their private letters (Allen, et al., 1994).

The royal patronage of science and the establishment of the royal scientific societies in the seventeenth century across Europe—and the rise of the scholarly journals emerging from these societies—helped to foster more open forms of science (David, 2008). A brief review of the history of the scholarly journal demonstrates that the balance between the values of commons and commerce dates back to the origins of the scholarly journal itself.

#### 1.4.5. The Birth of the Scholarly Journal

The *Philosophical Transactions*, established by the Joint Secretary of the Royal Society, Henry Oldenburg in March 1665, became the model for scientific reporting — establishing the printed word as the primary mechanism through which scholars communicated the results of their work.

The journal provided what Guédon terms as a “social registry of scientific innovations” (Guédon, 2001). The journal further established the means by which scholars claimed their right to the intellectual property of their articles by being the first to publish and communicate their findings. Systems of quality control imposed by *Philosophical Transactions* to review articles by society members prior to acceptance for publication founded the central functions of scholarly journals that endure to this day: namely peer-review, and scientific priority. Oldenburg’s journal thus established the four primary functions of scholarly publishing that have endured over the centuries: registration, dissemination, peer review, and maintenance of the archival record (Mabe, 2009).

In the introduction to the first issue of *Philosophical Transactions*, Henry Oldenburg wrote that the aim of the publication was to give researchers a venue to “search, try, and find out new things, impart their knowledge to one another, and contribute what they can to the grand design of improving natural knowledge, and perfecting all Philosophical Arts, and Sciences” (Oldenburg, 1665). Yet despite Oldenburg’s ideological reflection of communal values of the academy, the practical constraints of the political economy of the time necessitated balancing commerce to ensure its viability.

During the late 1600s, print publishing had yet to establish itself on a sound financial basis; indeed, a number of the Royal Society’s initial efforts in book publishing had struggled to recover costs of publication (Willinsky, 2017 p.233). Oldenburg made an innovative move by taking advantage of the form of the short pamphlet, popular in the coffeehouses of seventeenth-century London. Leveraging the relatively recent distribution technology of the royal postal service (extended to the public in 1635) and the simultaneous emergence of periodical literature, Oldenburg identified an opportunity to contribute toward expanding access to scholarly work

(Willinsky, 2017, p.234). Taking on the risk of this venture by financing the publication himself, Oldenburg arranged for the printing of a monthly issue to be sold at one shilling each, and negotiated the printing of 1,000 copies. He believed he would break even with the sale of 300 copies, suggesting that each issue cost £15 to produce (Royal Society, 2015). If he were to sell 500 copies, both the printer and publisher would manage a profit of £5 each per issue. Not particularly lucrative, but also not trivial. Oldenburg never succeeded in gaining his living from the journal during his lifetime—the most it had ever done, he noted in 1668, was to cover the rent on his house in Piccadilly (Royal Society, 2015). Yet through his efforts, he established the journal as the principal means for scholarly communication, supported by a viable and gainful financial subscription model that endures to the present day.

#### 1.4.6. The Professionalization of Scholarship

For at least the first two hundred years of its history, scholarly publishing remained in the hands of scholars. With Henry Oldenburg having established the new medium for scholarly communication, the importance of scientific publications grew in the centuries that followed as academic knowledge began to transform society's views on nature. During the Enlightenment period and into the nineteenth century, a burgeoning reading public in Europe and the United States was being served by an increased number of periodicals, including many from scientific societies which published a range of content, from shorted journalistic pieces on science issues, to full research articles(Fyfe, 2016).

Since Oldenburg's first periodical, scholarly societies and independent journals alike relied on the services of professional publishers and booksellers. Similar to *Transactions*, these periodicals were not considered as profitable ventures, particularly given the small and uncertain demand for specialist scientific content. Scholarly journals were rarely expected to cover their



costs, and were for the most part subsidized by their parent society or academic institution. The costs of production were often supported through sponsorships from patrons, allowing discounted or sometimes free, distribution of the periodicals. In certain cases, (such as the example of Fell's bible), publishers identified opportunities to sell content for commercial benefit. Although some were successful in this endeavor, few publishers before the advent of the twentieth century managed to do better than break even (Fyfe, 2016).

The late nineteenth century saw the replacement of the voluntary culture of scholarly societies and periodicals by professional academic communities, with the establishment of new universities across the United States and Europe. Although universities in the United States trace their history back to the establishment of Harvard in 1636, it wasn't until the end of the Civil War that university presidents conceived of a distinctly "new American university"—building on a model established by Humboldt's founding of the University of Berlin a century earlier—as centers of scholarship and research (Drucker, 1985, p.23). Once an elite and exclusive activity, higher education in the United States was opened more broadly to the public by the signing of the Morrill Land-Grant Act of 1892 by Abraham Lincoln (Heller, 2007). This legislation placed federal resources in the hands of states to invest heavily in public higher education in the form of land grants to establish or provide funding for existing universities (Kerr, 1963). The signing of the Morrill Land-Grant Act helped to further the established notion that higher education was a public good that benefited society overall. It was considered a central and primary force for building an educated population, critical to the maintenance of a democratic system, for the growth of the middle class and to promote economic growth and prosperity (Bloom, et al., 2006; Ehrenberg, 2006; Longanecker, 2005; Newfield, 2008; Zumeta et al., 2012). There was, in effect,

a social contract that existed between citizens and public universities that supported the public funding for higher education (Newman & Couturier, 2004).

The expansion of higher education and university research during this era led to a corresponding growth in the number of journals (Guédon, 2001). Set against this background, the first university presses were established in the United States, Johns Hopkins University in 1878, which remains the country's oldest continuously operating university press. In founding the press, the university's first president, Daniel Coit Gilman famously pronounced: "It is one of the noblest duties of a university to advance knowledge, and to diffuse it not merely among those who can attend the daily lectures — but far and wide" (Givler, 2019). Part of this duty involved the publishing of works that were not commercially viable; these texts would be subsidized by their institutions who were performing a service to the public, central to the values of the university and to scholarship.

In the rapidly changing marketplace of the nineteenth and early twentieth century, learned societies found themselves struggling to keep up in a growing publishing enterprise where speed and efficiency were of the essence. This provided an opportunity for commercial publishing houses, who proved to be far more efficient at disseminating periodicals than scientific societies. Although commercial publishers did not initially consider scholarly journals to be a lucrative business, they realized that the associated prestige could help raise their profile (Guédon, 2001).

Learned societies and university presses alike began to outsource components of their publishing activities to commercial publishers. In economic terms, it made little sense for universities to take on the entire costs of production of specialist scientific works for which there might be little demand in their home institution. Instead, commercial publishers, with their

greater access to broader markets, might be able to generate sufficient revenues to secure the financial viability of scholarly works. For societies, this outsourcing enabled them to focus on their core mission of advancing scholarship. For publishers, it resulted in increased prestige owing to publishing scholarly content, with little to no expectation of profit. Publishers began to facilitate some of the communal aspects of scholarship, including peer review, provided for free by academics in service to their discipline and as a mark of prestige and achievement. Libraries, more focused on cataloging and acquisitions to serve their constituents, had local, internal costs that would have been difficult to fund through market transactions with external customers. Having purchased printed volumes, libraries would store and organize their collections and make them available at no charge to members of their institution (Fyfe, 2016).

As scholarly journals in the early twentieth century consolidated their position as the main channel for communication of scientific findings, publishers worked harmoniously with universities and learned societies as minority partners in the publishing enterprise, largely without profit motives. Most scholarly publications during this period existed on a spectrum between commercial undertakings and sponsorship, with most balancing their sponsored ideals of openness with some degree of commercial risk (Fyfe et al., 2017). The dramatically transformed political economy of the post–World War II period led to a rapid evolution of universities and research cultures, and consequently transformed the scholarly publishing industry.

#### 1.4.7. Mertonian norms and the ethos of science

In 1942, the renowned sociologist of science Robert Merton provided a compelling moral argument for the maintaining the scholarly commons in his work *The Normative Structure of Science*. Written as a reaction against totalitarianism threatening science, Merton described four

interrelated norms that derive from “the institutional goal of science,” to be “the extension of certified knowledge” (Merton, 1942. p.117). Merton described these norms as representing the ethos of modern science: “[t]he mores of science possess a methodological rationale but they are binding, not because they are procedurally efficient, but because they are believed right and good. They are moral, not technical, prescriptions” (Merton, 1942. p.118). He described four sets of institutional imperatives: namely, universalism, communalism (“communism” in the original), disinterestedness and organized skepticism.

According to Merton, the principle of universalism implies that the work of scientists should be assessed on “preestablished impersonal criteria: consonance with observation and with previously confirmed knowledge” (Merton, 1942, p.118), rather than personal characteristics. The scientific enterprise, as an institution of organized skepticism, referring to the: “detached scrutiny of beliefs in terms of empirical and logical criteria” (Merton, 1942, p.126), can only function optimally if the results of research are transparently communicated, so that they may be subject to test and scrutiny by the scientific community. Given that research builds on existing knowledge, the efficient functioning of this systems relies on the availability of knowledge to the scientific community. The principle of disinterestedness dictates that the work of scientists remain uncorrupted by self-interest; the motivation for scientists is to advance the institutional imperatives over the personal. According to Merton: “The scientist’s claim to ‘his’ intellectual property is limited to that of recognition and esteem which... is roughly commensurate with the significance of the increments brought to the common fund of knowledge,” describing the norm of communalism existing in the scholarly enterprise (Merton, 1942, p.286).

Mertonian norms consider that the monetizing of knowledge or its treatment as private property, as being fundamentally at odds with the ethos of science, limiting the scientific

enterprise and its contribution to society. Writing during the prevailing era of print journal publication, Merton provided a strong moral basis for defining the scientific enterprise as a non-commercial sphere of intellectual production, distribution and consumption—an intellectual commons.

#### 1.4.8. Post–World War II Expansion of Higher Education and Research

In the years immediately following World War II, the United States and Europe experienced massive expansions in higher education and research, driven by ideological and financial commitments by their respective governments (Machlup, 1962; Slaughter & Leslie, 1997; Rubin, Huber & Taylor, 1986). The postwar belief that science would be the key to economic preeminence as well as military advantage, revolutionized the place of the university in American society. Congress enacted legislation that led to massive investments in higher education, including the GI Bill in 1944. According to Bok, this postwar investment in higher education and science spurred a “...transformation of higher education in the United States from a set of institutions servicing an elite to one with an open door for all who were able and willing to seek further learning” (Bok, 1990). The benefits of both education and research were viewed as crucial for national security and for society, and therefore worthy of significant investment by both federal and state governments.

The postwar consensus to support massive federal research funding was bolstered in 1945 with the publication of Vannevar Bush's report on the role universities in scientific progress, *Science the Endless Frontier*, which is also attributed with helping establish the National Science Foundation and the National Institutes of Health (Courant et al., 2010; Zemsky & Wegner, 2005). Bush's report emphasized the central role of universities as being “...uniquely qualified by tradition and by their special characteristics to carry on basic research. They are charged with

the responsibility of conserving the knowledge accumulated by the past, imparting that knowledge to students, and contributing to new knowledge of all kinds” (Bush, 1945). The mission to develop and foster an intellectual commons had, in fact, been widely recognized for the best part of a century among American institutions of higher education (Hofstadter, 1955; Argyres & Liebeskind, 1998). Although this idealistic vision was never fully realized, for the next 30 higher education in the United States grew dramatically through federal and state contributions towards the sector, as well as investments made during the “Space Race” with the Soviet Union. The influx of funding to the National Institutes of Health, the National Science Foundation, and other federal agencies led to the expansion of the scientific enterprise.

Increased participation in higher education required universities to employ more academic staff, who—under the influence of the German model of higher education entered careers that increasingly demanded research outputs as a measure of performance. Institutional expectations of academic performance became central to faculty tenure and promotion, and with research prestige becoming a vital evaluative measure for career advancement (Morley, 2016; Coate & Kandiko-Howson, 2016).

The growth of research communities in the United States, Europe, and other parts of the world led to an internationalization of the research enterprise, and the reputation of scholars began to be assessed within increasingly international disciplinary communities. This trend further reinforced the evaluation of individual intellectual and academic performance through research outputs and publications in journals (Fyfe et al., 2017). The corresponding expansion of scientific publications in this new global research enterprise was aided by the established connections between universities and commercial publishers, as well as the increased use of English as the global language for scholarship. Much of the growth in this segment of the journal

market was propelled by publishers from Britain as well as the Netherlands in the 1950s, who successfully fostered a global community of scientists contributing to English-language journals (Meadows, 1980).

With increased funding for research, universities were experiencing a knowledge boom where the production of knowledge far exceeded their capacity to distribute that knowledge, again causing them to turn increasingly to their commercial publisher partners to support the communication of the growing volume of research. This prompted an exponential growth in the volume of journal publishing, with the number of journals doubling approximately every 15 years (de Solla Price, 1963).

#### 1.4.9. The Science Citation Index and the Introduction of Market Inelasticity

In the mid 1950s, Eugene Garfield—a structural linguist from the University of Pennsylvania—was prompted to study new mechanisms for tracking the propagation of scientific thinking through mapping patterns of citation. Evoking H.G. Wells’ vision of a “World Brain” that provided the possibility of “having all recorded knowledge at one’s fingertips,” Garfield developed the Science Citation Index (SCI) in 1955 as a tool to “facilitate the dissemination and retrieval of scientific literature” (Garfield, 1964).

Garfield’s work led to the development of the Institute for Scientific Information (ISI), a private company that proved to be highly influential in scholarly publishing. The SCI, which began with a collection of around a thousand titles, became the *de facto* arbiter of quality in scientific publication, and it unwittingly gave the ISI tremendous power in determining what journals would be included, and what would be excluded from the SCI (Guédon, 2001). What was formerly a competition for excellence within scientific publishing became a two-tier system of elite journals that were within the SCI, and those that were not.

Garfield's approximation of journals in the SCI being "core science" began to be considered by librarians as the benchmark in scholarly publishing. With a mission to serve their research communities and to aid in collection development in a time of vast expansion in the publishing of scholarly journals, academic libraries began to focus their collection development activities on the acquisition of journals listed in the SCI. As Guédon (2001) describes, in North American libraries the journals indexed within the SCI began to be thought of as being "indispensable." The creation of this "elite" set of journals and the increased focus around their acquisition turned scholarly publishing from a marginal activity into an inelastic market with tremendous potential for profit; an opportunity that did not escape the attention of commercial publishers.

#### 1.4.10. The Rise of Corporate Publishers in Scholarly Communication

The emergence of commercial firms in academic publishing precipitated a dramatic change in the industry in the post-World War II period. Prompted by investments in science and higher education and commensurate increases in university library budgets, more research was being published, and there were more institutions to purchase it. Knowledge-producing universities and scholarly societies were entrenched in this knowledge boom, and were experiencing difficulties in distributing the plethora of new research. They turned increasingly to their commercial publishing partners, a relationship that was initially beneficial for all participants as it increased the needed outlets for knowledge distribution and provided commercial publishers with access to a new market (Wyly, 1998). New entrants into academic publishing adopted commercial strategies that would come to dominate the enterprise. These strategies proved so lucrative for these publishers that they were adopted by established commercial publishers, as well as many mission-driven society publishers and university presses.



The most influential and notorious of these publishers was Czech-born, British media magnate Robert Maxwell/Ján Ludvík Hoch, distributor of German science publisher Springer-Verlag and owner of the academic publishing press Pergamon. Recognizing the relatively untapped economic potential of science journals, Maxwell started to acquire specialist academic journals and presses (Merrett, 2006). Scholarly societies and academic journals found this situation desirable because they could outsource publishing activities to entities with greater professional capacities, and be left to the “real work” of undertaking their research and communicating their findings.

Maxwell’s Pergamon Press also made a strategic decision to primarily publish primary research content, setting up dozens of journals in disciplines and nascent subdisciplines that lacked publication outlets of their own. In a matter of two years, from 1955 to 1957, the output of Pergamon Press grew from 50 journals and books to more than 100:

In addition to publishing new journals, Maxwell was alert to the opportunities provided by existing ones, and he began to take over the business management of established but unexploited specialist journals from learned societies . . . Relentlessly, universities throughout the world were being offered an increasing range of journals which, because of the prestige of the editorial boards, their librarians were initially eager to buy (Carrigan, 1996, p. 210).

For a commercial publisher, Maxwell was astute in identifying specialized scholarly journals as an attractive business venture. He recognized the commercial opportunity of selling to institutions, who could be charged more for subscriptions than individuals, as libraries of major research institutions were obliged via their mission to subscribe to journals that disseminated

vital scholarship—whether in the sciences, social sciences, or humanities giving the vendor a captive market of willing customers.

What further made academic journals a favorable commercial prospect was that much of the major steps of the production process—from content-production to editing and reviewing for academic journals—was provided for free from the perspective of the journal publisher: editors are paid by either universities or federal funding agencies and are not further compensated by publishers, and authors contribute articles to journals without any expectation of monetary return. Furthermore, for many journals, the subscription fees are paid well in advance by subscribers even before a product is received, most commonly at the beginning of a subscription year. For a publisher, these fees acted as investment capital, giving them liquidity to make investments, with production costs spread over the course of a year. With reference to the financial position of a scholarly journal publisher, Robert Maxwell once proudly stated in an interview: “I set up a perpetual financing machine through advance subscriptions as well as the profits on the sales themselves. It is a cash generator twice over” (quoted in Carrigan, 1996, p. 210).

Pergamon Press’ commercial success was further solidified by their international focus, delivering a much broader readership and subscription base than traditional journals that tended to have a more national or regional orientation.

The traditional mode of scholarly publishing established by learned societies and university presses that prioritized the dissemination of knowledge without profit motives was beginning to be replaced by a new model in which it was not only possible to break even, but also to make substantial surpluses. As Edwards and Shulenburger (2003) describe, “the commercial publishers, recognized the relative inelasticity of both supply and demand, acquired

top-quality journals, and then dramatically raised prices, expecting that they would lose relatively little of the market.” The trend started by Maxwell’s Pergamon Press was continued by publishing conglomerates, such as Springer-Verlag and Elsevier, who commenced publishing scholarly journals.

From the 1950s to 1970s, scholarly publishers—commercial and non-profit alike—all adopted increasingly advanced business approaches. As an example, publishers recognized that they could achieve significant economies of scale by acquiring titles from smaller publishers, or launching new journals of their own. While larger scientific societies with multiple journals (such as the American Chemical Society) were able to effectively run and manage their own publishing operations, the vast majority of societies (approaching 90%) who publish just one or two journals began to enter into arrangements for the publishing of their journals with commercial publishers (Crow, 2006). This growth and consolidation within the publishing industry market the beginning of a trend which began in the 1960s, but dramatically intensified in the 1990s through corporate mergers and acquisitions (Fyfe et al., 2016).

For mission-driven publishers the emergence of a viable commercial model led to a transition in the goals of their publishing divisions (Fyfe, 2016). Rather than simply aiming to cover the costs of publication, income generation from journal divisions became a major stream to support society and institutional goals. Thus, the role of scholarly publishing was tacitly recast. Rather than serving as a vehicle for the dissemination of knowledge as a service to disciplinary and broader academic communities, journal publishing became a source for generating revenues. Recognizing the opportunity to raise society income through their publishing activities, larger society publishers strengthened their publishing capacity and increased their publishing portfolios (Fyfe et al., 2016). University Press publishing, once subsidized by their parent

universities, was similarly driven to generate profits—diverging from their mission to support scholarly publishing irrespective of commercial viability—and enter into a very different and much more competitive market (Guédon, 2016).

#### 1.4.11. Communal Breakdown: The Serials Crisis

Just as economic crisis gripped the West in the 1970s, the supply and price of academic journals began to boom. Having absorbed or bought most of the specialized academic journals, publishers such as Maxwell's Pergamon Press built virtual monopolies on the distribution of specialized knowledge, and began to charge extraordinarily high subscription rates. The monopolistic structure of the journal industry combined with the extraordinary high rates for journal subscriptions—during a time of financial decline for universities—led to the serials crisis (Panitch & Michalak, 2005). With the majority of scholarly journals falling under distribution by commercial ventures, journal production became intimately tied to the commercial interests of a few large-scale publishers.

As a consequence of the decline in federal, state, and provincial funding over the past few decades, which led to overall cuts in university operating budgets, university research libraries found themselves operating on reduced budgets. According to a 2014 report by the Association of Research Libraries (ARL), libraries steadily lost ground in the past two decades as percentage of overall university expenditures. According to data from 40 North American research libraries, the total percentage of institutional budget allocations for libraries has declined from 3.7% in 1984 to 1.8% in 2011, a trend that is visible across both public and private universities (ARL, 2014).

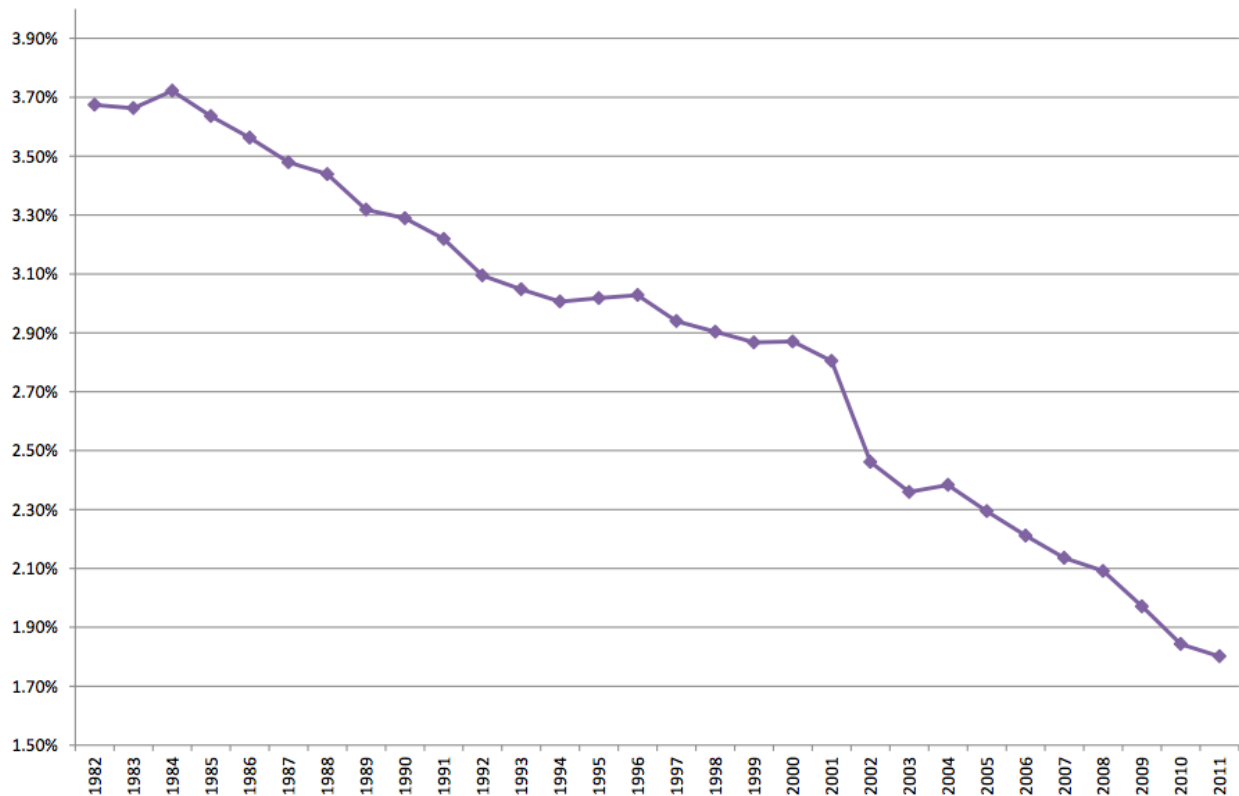


Figure 1.1. Library Expenditure as a Percent of Total University Expenditures (Average of 40 US Institutions Reporting Since 1982) (Source: ARL Statistics, Association of Research Libraries, 2014)

For research libraries budgetary constraints were exacerbated by the dramatic increase in costs for subscriptions to scholarly journals (Okerson, 1996; ARL, 2014). Research libraries, playing their role of serving academics and preserving the knowledge commons, were limited in their ability to acquire new academic knowledge in the form of journals, monographs, and scholarly books. In this climate, the extraordinarily high costs of STM journals and the impact these costs had on research libraries' ability to purchase new materials are defining features of the serials crisis (Panitch & Michalak, 2005).

#### 1.4.12. Corporate Consolidation

During the 1990s, a few of the largest scholarly publishers developed increasing market power. With monopolistic control over specialist academic titles and inelastic demand for “core science” journals, publishers enjoyed the ability to raise prices without worrying about cancellations. This was a period of corporate consolidation for scholarly publishers, as the large conglomerates began to absorb and merge with smaller publishers, securing greater market share. Only a handful of society publishers and university presses had the internal capacities and resources to compete effectively with larger commercial publishers. Smaller learned societies which lacked such publishing capacities (e.g. publishing workflows, copyediting, marketing, publishing platforms) increasingly outsources the publishing of their journals by entering into profit-sharing agreements with commercial publishers. These agreements provided these societies with access not only to the publishing capacities of their commercial partners, but also their much broader base of international customers. Although potentially financially lucrative, these publishing arrangements meant that these smaller societies lost much of their autonomy in making business decisions, which were increasingly dictated by the profit-making imperatives of their commercial partners (Fyfe et al., 2017).

In 1991, shortly before his death, Robert Maxwell sold Pergamon Press and its 400 journal titles for \$447 million to Holland's Reed Elsevier, resulting in an industry dominated by three commercial publishing giants, namely Reed Elsevier, Springer, and Wiley. The accompanying corporate opportunism saw the price of journals grow by 200% to 300% beyond the rate of inflation between 1975 and 1995 (Miller, 2007).

By the mid 1990s, the commercial publishing sector accounted 40% the total journal market, with scientific and professional societies at 25%, and university presses representing

approximately 16% (Tenopir & King, 1997). Elsevier's dominance among the commercial publishers was demonstrated in an analysis by the UK Competition Commission (2002) who showed that their share of SCI-indexed research output between 1994 and 1998 was 20% of all papers published. The profits for Elsevier, averaged about 37% between 1995 and 2001 (Edwards & Shulenberger, 2003).

#### 1.4.13. Publisher Oligopoly

Despite the opportunities for publishers to make dramatic cost savings on the production and dissemination in scholarly publishing in the years following the advent of digital technologies in the late 1990s, corporate control of the scholarly publishing industry grew even stronger. Researchers from the University of Montreal found that corporate consolidation has been one of the defining features of scholarly publishing over the past three decades, as many smaller publishers have been absorbed into large publishing conglomerates (Larivière et al., 2015). This corporate consolidation led to a dramatic increase in the profits of the major corporate publishers. During the period between 1991 and 1997, Reed Elsevier's profits doubled, and their profit margins rose from 17% to 26%. Although margins declined somewhat between 1998 and 2003, commercial publishers were able to maintain stable profits. In the years that followed—with the exception of the financial crisis of 2008—net profits as well as profit margins continued to increase, resulting in unprecedented profits by 2012 for the company of more than \$2 billion. Profit margins for the Elsevier's STM division higher still, increasing by a factor of 6 and never dropping below a 30% annual growth rate (Larivière, Haustein & Mungeon, 2015). In 2012, similar profit margins were obtained by the two other largest commercial journal publishers, John Wiley & Sons (STM and Scholarly division) at 28.3%, Springer Science and Business Media at 35%, and Taylor & Francis at 35.7%—margins that are on a par with some of the

world's most profitable companies according to Forbes' Global 2000. The concentration of the commercial giants of academic publishing--Elsevier, Springer, and Wiley-Blackwell--accounted for approximately 42% of all articles published in 2014; with control of the most prestigious journals, suggesting that the high profit margins achieved by these companies were due to oligopolistic conditions in the scholarly publishing market (Larivière et al., 2015).

A recent report published by the European University Association describes how across 31 consortia in 30 European countries, 1.025 billion euros per year are paid for accessing scholarly publications, with the bulk of the costs falling on universities. According to the report, scholarly journals/periodicals account for annual expenditure of 726 million per year, with 475 million (i.e., 65%) euros spent on journal "Big Deal" agreements with Elsevier, Springer-Nature, Taylor & Francis, Wiley, and the American Chemical Society (ACS) (Morais, Stoy, & Borrell-Damián, 2019). Moreover, these contracts are typically subject to annual cost increases of 3.6%, far exceeding the annual inflation rate across Europe of 1.75% in 2018 (Eurostat, 2018).



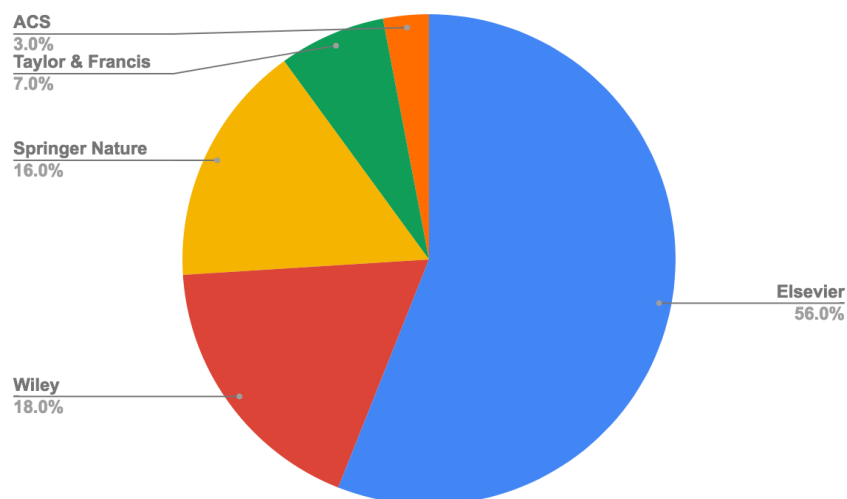


Figure 1.2. Breakdown of expenditure on top 5 Big Deal Contracts per publisher. Data for 29 Consortia (Source: *2019 Big Deals Survey Report: An Updated Mapping of Major Scholarly Publishing Contracts in Europe*, European Universities Association, 2019)

### 1.5. Reclaiming the Knowledge Commons

The advent of the internet leading into the digital era of the twenty-first century opened up vast new opportunities for the production and dissemination and research, which at first seemed strongly communal, with an emphasis on openness and worldwide access to knowledge. The first to recognize these opportunities was the physicist Paul Ginsparg who created the world's first online system for distributing scientific papers in 1991. Known as *arXiv*, the system allowed for the sharing of electronic copies of preprints of articles prior to being submitted to journals for publication. Just three years after the founding of *arXiv*, Stevan Harnad, a cognitive science professor from the University of Southampton posted a “subversive proposal,” in which he encouraged other scholars around the world to submit copies of their works into institutional

repositories—increasing the visibility of their work and eliminating the barriers to access posed by publisher subscription (Harnad, 1995). Harnad’s proposal generated significant interest and debate within the scholarly as well as publishing community, and heavily influenced the subsequent founding of the Open Access movement.

#### 1.5.1. The Open Access Movement

Open Access Publishing—or Open Access to scholarship—has emerged as a global movement to re-establish a knowledge commons in scholarly communication. In reaction to the constraints of the current system and leveraging the opportunities afforded by the digital revolution, open access advances a vision for scientific communication in which knowledge flows without restriction between the research community as well as amongst the wider public (Borgman, 2010). But rather than representing a new phenomenon, OA represents a natural progression of scholarly communications, embodying the values of scholars and libraries as custodians of the intellectual commons, dating back to antiquity:

The access principle... (is) that a commitment to the value and quality of research carries with it a responsibility to extend the circulation of this work as far as possible, and ideally to all who are interested in it and all who might profit by it — has a history that dates back to the great libraries of the past visited by scholars, whether one thinks of the fabled collection at Alexandria founded in the third century b.c. or the mosque libraries, such as the one at al-Azhar in Cairo, which flourished in and around the sixteenth century, or the small-town libraries that spread through nineteenth century America. (Willinsky, 2006, p.5)

The profound interrelation between the opportunity afforded by digital technologies to realize the intellectual commons was delineated by Jean Claude Guéron:

Open Access is not an end in itself; it is merely a symptom of deeper processes linked to the growing role of digitization in our civilization. It is digitization that brings about opportunities for profound shifts in power. Open Access simply defines a battle front that refers to the challenges being thrown at the architectures of control supported by publishers. Like a litmus test, the quest for Open Access reveals an architecture of control on the wane. (Guédon, 2008)

Willinsky elaborates on this opportunity: “open access could be the next step in a tradition that includes the printing press and penny post, public libraries and public schools. It is a tradition bent on increasing the democratic circulation of knowledge” (Willinsky, 2006, p.30).

OA refers to the “free and unrestricted worldwide electronic distribution and availability of peer-reviewed journal literature” (Budapest OA Initiative, 2002). OA to books and monographs is also a stream of activity with the movement, although its development remains somewhat behind the movement to open scholarly journals. According to Peter Suber:

Open access (OA) is free online access [ . . . ] OA literature is not only free of charge to everyone with an internet connection, but free of most copyright and licensing restrictions. OA literature is barrier-free literature produced by removing the price barriers and permission barriers that block access and limit usage of most conventionally published literature, whether in print or online. (Suber, 2007)

The academic community has increasingly expressed its disaffection with publisher business practices: for example, the Cost of Knowledge Petition (signed by over 17,650 academics to date), cites the “...exorbitantly high prices for subscriptions to individual journals” (Cost of Knowledge Petition, 2012). This chorus of discontent from the academic community has multiplied through the increased engagement of librarians, universities, funders and government

agencies who consider the subscription model unaffordable and untenable. In the United States, for example, in 2012, the library of Harvard University—the world’s wealthiest academic institution in the world—issued a memo to its teaching and research staff, which stated:

Even though scholarly output continues to grow and publishing can be expensive, profit margins of 35% and more suggest that the prices we must pay do not solely result from an increasing supply of new articles ... The Faculty Advisory Council to the Library, representing university faculty in all schools and in consultation with the Harvard Library leadership, reached this conclusion: major periodical subscriptions, especially to electronic journals published by historically key providers, cannot be sustained: continuing these subscriptions on their current footing is financially untenable. (Harvard University Library, 2012)

The librarian memo further encouraged its faculty to publish in OA journals, and to discontinue providing editorial support to paywalled journals.

In a scathing critique of the prevailing system of scholarly publishing published in the *Guardian*, provocatively entitled “Academic Publishers Make Murdoch Look Like a Socialist”, the journalist George Monbiot described the business practices of commercial publishers as “...pure rentier capitalism: monopolizing a public resource then charging exorbitant fees to use it. Another term for it is economic parasitism” (Monbiot, 2011). Permission barriers have also played a key role in motivating the OA movement. The legal scholar Dan Hunter has addressed this issue following a commercial publisher demanding he remove his work from the Social Science Research Network, writing in a subsequent piece entitled “Walled Gardens,” that “...many of the top law reviews are acting as stalking horses for the commercial interests of legal database providers” (Hunter, 2005). These “walled gardens” were described by Nancy Kranich

as a new form of commons enclosure, which represents “an increasing threat to democratic principles of informed citizens and academic principles of building on the shoulders of giants” (Kranich, 2006).

In response to the affordability and access constraints of the subscription-based system of scholarly publishing, the OA movement which has roots in the early 1990s has gained significant traction in the past decade (Suber, 2009), specifically bolstered by formal policy declarations and their subsequent implementation.

### 1.5.2. The Three Bs

The formalization of the OA movement came in the early 2000s, with three major policy declarations that have collectively come to be known as the Three B’s. These include the Budapest Open Access Initiative (2002), the Bethesda Statement on Open Access Publishing (2003), and the Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities (2003). Although slight distinctions exist across each of these three statements, they share the common principles of the removal paywalls and permission restrictions for scholarly works (Suber, 2007). As highlighted by Dallmeier-Tiessen (2010), other shared principles include flexibility on use and reuse rights for the original as well as derivative works, as well as ensuring author consent in content licensing. While setting out core principles for the Oa movement, the Three B’s have avoided being too prescriptive, in order to “...keep it simple and not confusing, yet complex enough to accommodate diversity” (Ress, 2010).

### 1.5.3. Open Access Publishing Models

In 2000, the Nobel laureate, Harold Varmus, who was instrumental in the development of PubMed Central during his time as Director of the NIH, decided that the OA envelope needed to

be pushed further. He founded the Public Library of Science (PLOS), along with fellow scientists He and fellow scientists Michael Eisen and Patrick Brown, which was initially a movement encouraging other scholars to boycott publishing in, or providing editorial support to journals which were not freely available through the PubMed Central platform. Although almost 35,000 scholars from around the world signed their pledge, compliance with the agreement was low (Poynder, 2004). Deciding to start their own nonprofit publishing operation, with substantial funding support from the Gordon and Betty Moore foundation, PLOS launched its journal platform in 2003. Describing themselves as a “nonprofit publisher, innovator and advocacy organization”, PLOS now publishes OA biomedical journals, including pioneering the model of the OA “mega-journal” with their publication *PLOS One*, a large-scale, broad scope, OA journal (Spezi et al., 2017).

Another major development in OA journal publishing was the creation of BioMed Central (BMC), the first major OA publishing venture that was an explicitly commercial entity, begun by the publishing entrepreneur Vitek Tracz. Tracz recognized the commercial opportunity with OA publishing based on the “author-pays” model, as well as institutional memberships. After securing the title of the “world’s largest OA publisher,” BMC was purchased by publishing conglomerate Springer in 2008. Derk Haank--the then CEO of Springer’s journal publishing division--affirmed the notion that OA was part of their business strategy as a commercial entity, saying, “this acquisition reinforces the fact that we see open access publishing as a sustainable part of [scientific, technical, and medical] publishing, and not an ideological crusade” (Gawrylewsky, 2008).

In 2003, David Prosser proposed a model termed “hybrid OA” where authors are given the option of publishing their accepted article within a conventional subscription journal with the

payment of a fee, termed as an Author Processing Charge, or APC (Prosser, 2003). Originally proposed as a model to transition subscription-based journals to OA publishing, the hybrid model was instead coopted by publishers as a mechanism to develop new revenue streams. The first large publisher to embrace hybrid OA was Springer, through its *Open Choice* program which was launched in 2004 with APCs averaging around \$3000. Björk (2012) described Springer's model as setting a precedent for APCs for hybrid programs adopted by many other journal publishers, particularly as the \$3000 APC price was aligned to meet the maximum amount funders were estimated to be willing to pay for article publishing. Despite the number of journals offering hybrid publishing doubling between 2010 and 2012 to more than 4,300, publishing around 12,000 OA articles (in 2011), Björk found that uptake of the hybrid option was low, primarily due to the generally high price level of hybrid APCs at \$3000, compared to so called "gold OA"<sup>1</sup> journals that were entirely funded by APCs, averaging around \$900 (although uptake was variable across publishers) (Björk, 2012). Originally intended as a way to transition journals to OA, hybrid quickly became established as a "preferred, semi-stable, business plan of companies intent on maximizing profits" (Guédon, 2016). This was further solidified by the publishing giant Elsevier, who described in how they "de-couple" the pricing for their journals from APCs and subscription pricing for their journals. This implied that despite the volume of articles that might be published (and thus financially supported) in journals via APC model, it would have no bearing on the subscription price. In some cases, it might even lead to an increase in the subscription price, as OA content can deliver more value (through increased readership and citations), and the prices of subscriptions are determined by value rather than cost of production (Eve, 2015). Hybrid OA allowed commercial publishers to effectively co-opt the

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<sup>1</sup> Appendix A provides a detailed review of various OA business models

collective values of OA, allowing them to make broad claims about their support of OA and meet funder requirements for OA, all the while increasing their revenues.

With a large number of publishers seemingly embracing OA by offering hybrid OA models to authors, the model has been met with criticism by universities and libraries who accuse publishers of appropriating the OA spirit to further increase their profits through “double dipping,” i.e., charging authors APC fees for their articles, while also charging university libraries full subscription prices for journals (Anderson, 2013; Björk & Solomon, 2014; Suber, 2012). This practice has provided publishers with two income streams: conventional subscription revenue, and author fees for OA. The net effect has been a net positive increase in income from institutional customers. University libraries argue that subscription prices should be reduced proportionately to the number of articles that are published via APCs (Pinfield, Salter & Bath, 2016). As a result of this conflict, increasing numbers of publishers are entering “offsetting” arrangements with libraries who seek to offset OA publishing costs against their subscription spends. Unfortunately, the widespread practice of nondisclosure agreements between publishers and libraries have made the financial impact of such offsetting agreements difficult to verify (Björk & Solomon, 2014).

#### 1.5.4. OA2020 on the Horizon

In 2015, the Max Planck Digital Library (MPDL)—the central licensing body for the network of research institutes supported by the Max Planck Society—published a paper entitled “Disrupting the subscription journals’ business model for the necessary large-scale transformation to open access” (Schimmer, Geschun & Volger, 2015), in which they outline a proposal to “flip” the scholarly communications market from one that is dominated by subscription journals, to one that is predominantly OA, by the year 2020. The paper describes how there are sufficient funds



currently circulating in the subscription industry—upwards of \$10 billion annually on a global basis—to support the publishing of all of scholarship OA; the funds simply need to be redirected. Under the auspices of the Berlin Open Access Initiative, the MPDL has launched a global initiative, entitled OA2020, with a stated mission to: “[t]ransform the current publishing system, replacing the subscription business model with new models that ensure outputs are open and reusable and that the costs behind their dissemination are transparent and economically sustainable.” As of June, 2019, 136 scholarly organizations from around the world — predominantly from Europe, but also notably including the University of California system— have signed the Expression of Interest.

As a result of the support from OA2020, but also due to a number of efforts by national research funders and library consortia worldwide, librarians have been placing pressure on publishers to develop sustainable mechanisms to support the redirection of subscription budgets towards supporting OA publishing, and a number of transitional models have emerged. These transitional models—also termed “transformative agreements”—have emerged in a number of variations, but are primarily focused on offsetting of author fees against the total costs of subscriptions for research institutions (a more detailed treatment of these transitional models is provided in Appendix A Section 2).

The proliferation of offset deals by major research institutions and consortia in Europe, and their increased pursuit in the U.S., has raised a new set of concerns. These deals, which have primarily been focused on large commercial publishers, and only support the OA transition for content published by authors from an institution or national level consortium, have only advanced OA in a piecemeal fashion. Offset models in effect replicate many of the current issues in scholarly publishing: they steer authors towards certain publishers, reinforcing the

oligopolistic control they exercise over scholarly publishing. The details of these deals, which remain mostly non-disclosable, continue to enable price-discrimination by commercial publishers. These deals also do little to address the marginalization of researchers from lower income settings: once excluded from accessing content due the financial barrier of the subscription model, these communities will be further (and perhaps more damagingly) excluded from participating in research communication due to the levying of prohibitive author fees.

The standoff after years of negotiation on the terms of an offset deal between the University of California and Elsevier exemplifies the challenge that the community faces. Further, it demonstrates why the goals of the OA2020 transition have yet to be realized.

#### 1.5.5. Collective and Cooperative OA Models

Given the pitfalls of APC-based and offset transitional models, Willinsky (2016) advances the notion that collective and cooperative activities, rather than consumer-vendor relationships, among scholarly publishing stakeholders might be one way to advance more “sustainable and financially responsible” OA (Willinsky, 2016). In the course of this thesis, the term “cooperative” is used in two senses. It is primarily used as an adjective to describe acts of collaboration among stakeholders, in which they are, for example, working together for mutual economic benefit in a cooperative way. Yet “cooperative” is used in this thesis is used as a noun, as well, to identify specific organizational and legal arrangements; in this sense it is “a special type of corporation owned and controlled by members that use their services” (Crow, 2006). Raym Crow, for example, has proposed the formation of “OA Publishing Cooperatives,” which are discussed in Appendix A (2006). Elinor Ostrom, who has done much work on the benefits of cooperatives for managing natural resources, has advocated for the cooperative as a way of managing a knowledge commons, with more detail in the literature review on this (Ostrom,

1990; Hess & Ostrom, 1996; Hess & Ostrom, 2003). What Ostrom highlights about cooperatives that applies to both senses of the terms in this thesis is how it invokes a shared recognition of the value, resources, and expertise each party brings to an arrangement.

In this context, there are a number of emerging models in which stakeholders are engaging in cooperative efforts, primarily driven by the communal spirit and values of libraries, to redirect their financial resources—once exclusively dedicated for subscriptions—toward supporting OA. A leading example is the Sponsoring Consortium for Open Access Publishing in Particle Physics (or SCOAP<sup>3</sup>), an example of an OA publishing cooperative, consisting of libraries only, but with a governance and organizational structure managed by the European Organization for Nuclear Research (CERN). SCOAP<sup>3</sup> aims to convert traditional closed access high-energy physics journals to OA by leveraging the collective spirit between libraries and has created a mechanism to transition financial resources spent by libraries on subscriptions to fund the transition of the top journals in the field. Using a tendering model to create competition, they have effectively transitioned the leading journals in the field to a publishing service model. Through this approach they have also been to reduce costs; SCOAP<sup>3</sup> has been able to secure average APCs of \$1,213 for 2014–2015, described as being “the best value-for-money in the Open Access marketplace” (Romeu et al., 2014). The consortium has grown since its inception to include more than 3,000 libraries across 44 countries, whose financial contributions to the collective fund are calculated based on a function of their GDP as well as their respective national published output in supported journals.

A similar library-supported cooperative approach to advance OA has been launched to serve the humanities, an academic field where APC models for OA have fallen flat due to the relative shortage of funding. The Open Library of the Humanities (OLH) is a nonprofit platform

led by academics that publishes OA journals, a mega journal, as well as monographs, supported by funding contributions from participating libraries. The OLH works through a collective model, with its costs supported by financial support from a large number of participating libraries. In this model, participating libraries invest in a community-shared service while also receiving a governance stake in the project (Eve, et al. 2015). Knowledge Unlatched (KU), a similar library-supported “crowdfunding platform” solicits collective library support to effectively purchase OA content. In their appeal to libraries for contributions for support, KU emphasize how librarians can act as “catalysts” in the shift to OA, and stressing their dependence on the communal spirit of “libraries working together for the benefit of the whole community” (KU, 2017).

Last but certainly not the least of these few examples is the Library Publishing Coalition (LPC), founded in 2013 by academic libraries with the support of the Mellon Foundation. Built on the foundation of a cooperative effort between libraries, the LPC has built a network to support an “evolving, distributed, and diverse range of library production and publishing practices” (Davis, 2013). With the support of 115 research libraries, the LPC published more than 400 OA journals and 73 books in association with 30 university presses in 2014–2015.

#### 1.5.6. Open Access Publishing Policies

The growth in OA has also been promoted by the access policies of many major funding agencies, both public and private, to advance OA to funded research, and also to overcome potential resistance from within the academic community (Willinsky, 2006). The fundamental premise supporting these policies is that the outputs emanating from publicly funded research should be available free and without restrictions on reuse and republication.

In the United States, a number of research funding bodies have instituted OA policies, prompted by the National Institutes of Health's (NIH) leadership in mandating funded authors to upload copies of their research outputs to the PubMed Central repository (Suber, 2009). Initially only voluntary, the mandated deposit in the NIH policy demonstrated moderate success, with a reported compliance rate of 75% (Poynder, 2012). This mandate—from the world's largest research funding agency--has prompted publishers to put workflows into place to facilitate the submission of NIH articles (in most cases after an embargo period) into PubMed Central directly to support author compliance with the policy (Björk, 2013). The NIH mandate has been so influential that 70% of 67 academic publishers surveyed in a study by Laakso (2013) were found to have specific policies for compliance with the NIH policy. The NIH policy has, however, led to controversy among commercial publishers, who have challenged the mandate through “an aggressive and well-funded publishing lobby” (Suber, 2012).

The Federal Research Public Access Act (FASTR)—also known as “The Other Aaron's Law,” named for the deceased OA activist Aaron Swartz—built on the spirit of the NIH OA mandate, requiring that publicly funded research from grants made by 15 US government agencies (a total funding of around 100 million dollars annually) be available OA on the Internet within six months of publication in a peer-reviewed journal. Shortly following the introduction of the FASTR in 2013, the Obama Administration White House's Office of Science and Technology issued a policy that mandated that all federal agencies with research budgets in excess of 100 million dollars should ensure that the publications and data from their funded research should be made freely available within 12 months from the date of publication (Suber, 2013). These legislative efforts have been criticized by some scholars and librarians for their

embargo periods, which critics believe unduly protect the profit margins of commercial publishers (Björk, 2017).

The largest funder of scientific research in the United Kingdom, the Wellcome Trust, implemented its own OA policy in October 2005 with a requirement that its funded researchers provide OA to the results of the research it funds (Terry & Kiley, 2006). This mandate was shortly followed by a similar directive by the Bill and Melinda Gates Foundation, which initially allowed for a 12-month embargo on funded content, but was modified to require immediate OA publishing or online repository deposit of all funded research and underlying data (Strausheim, 2017).

The most ambitious effort by funders to accelerate the transition of scholarship to open, termed Plan S—with the “S” standing for “science, speed, solution, shock”—was launched in September 2018, led by the European Commission (EC) and European Research Council (ERC) (Else, 2018). The aim of Plan S is for research funders to dramatically impact, or shock, the scholarly publishing industry by demanding that all funded research be published in OA journals or platforms by 2020. The funders also expressed their intention to phase out funding support for articles published in hybrid OA journals by 2023, with support during the interim period only provided for journals covered by transformative arrangements (cOAlition S, 2018). Initially supported by national research funders from twelve European countries working collectively under the name “cOAlition S,” the effort has grown to include the Wellcome Trust and the Gates Foundation (Van Noorden, 2018), as well as major research funders in Jordan and Zambia, suggesting global momentum behind the effort. Research agencies in China—which became the world’s largest producer of research in 2018—have also released position papers in support of Plan S, although none have yet to formally join the coalition (Schiermeier, 2018).

Perhaps predictably so, Plan S was opposed by a number of non-OA publishers, particularly related to the implications on their hybrid publishing programs. Elsevier spokesman Tom Reller was quoted as saying: “if you think information should be free, go to Wikipedia” (Keulemans, 2018). The publisher of the journal *Science*, the American Association for the Advancement of Science, argued that Plan S “would not support high-quality peer-review, research publication and dissemination,” and “would disrupt scholarly communications, be a disservice to researchers, and impinge academic freedom” (Else, 2018). The argument that Plan S would impinge on academic freedom was also shared by some members of the academic community, who suggested in an online letter signed by over 1,775 scholars at the time of writing, that the implications of Plan S would severely limit their ability to publish in high-quality journals (Kamerlin, et al., 2018). However, another online petition organized by UC Berkeley biologist, and PLOS co-founder Michael Eisen—with more than 2,000 signatures at the time of writing—backed the principles underlying Plan S and supported its commitment “to continue working with funders, universities, research institutions and other stakeholders until we have created a stable, fair, effective and open system of scholarly communication” (Van Noorden, 2018). OASPA expressed their support for Plan S, and expressed their desire to “provide guidance and recommendations for how the funding of open-access publications should be implemented within Plan S” (Redhead, 2018). They further emphasized that the process should be more inclusive and rather than focusing solely on commercial publishers, should include smaller publishers, scholarly societies and publishing platforms in the decision-making process. In response to Plan S, one of the world’s largest publishers Springer Nature released a proposal entitled, *A Faster Path to an Open Future*, suggesting that publishers “move from being an enabler to being a driver of the open access transition” (Inchcoombe, 2019).

## 1.6. The Frontline Stand-Off

Despite increased pressure to move to open access models from funding agencies through Plan S, the current share of research output that acknowledges a cOAlition S member accounts for only about 6% of papers indexed in the *Web of Science* (Quaderi, Hardcastle, Petrou & Szomszor, 2019)—a percentage that is unlikely to influence industry-wide transformative change. Increasing examples of cooperation between libraries and publishers to advance OA—such as SCOAP<sup>3</sup>, OLH and KU—show promise for advancing openness, but they remain the exception rather than the rule. The consolidation of corporate interests of 70% of the scholarly journal market has placed the largest commercial publishers at a position of considerable strength (Larivière et al, 2016), with limited financial incentives to change the status quo. Librarians contend that the scholarly publishing industry reaps revenue and profit margins that are unconscionable, and harms the research enterprise (Buranyi, 2017).

As an example, a consortium of Dutch university libraries, negotiating licenses with publishers under the auspices of the Association of Universities in the Netherlands (VSNU), in 2015 announced a boycott of the world's largest scholarly publisher, Elsevier. As a first step in boycotting the publisher, the VSNU asked all Dutch scientists working as editors of Elsevier published journals to step down, which would be followed by asking reviewers to stop working for, and authors to stop publishing in Elsevier journals. VSNU highlighted the systemic concern relating to the subscription system, under which the public has to pay for the research to be conducted, and then again to read its results. The counter-argument from for-profit publishing companies has been that the costs of publication have to be met somehow, either through the payment of subscriptions for access to content, or through the payment of author fees for publication. This position has further been challenged by libraries and OA advocates who claim



that the costs of subscriptions and APCs are excessive, particularly as a significant amount of the labor in scholarly publishing, i.e., editing and reviewing, is unpaid work provided by academics.

As an outcome of the negotiations, in 2016 the VSNU and Elsevier agreed to 3-year “offset” deal in 10% of papers with published by authors from the Netherlands would be published OA in select Elsevier journals (predominantly in the biomedical field) at no additional expense to authors or universities, with the target percentages increasing in subsequent years. Critics of the deal were disappointed with the final terms of agreement, considering Elsevier to have “won” the negotiations despite significant negotiating power of the consortium (Hartgerink, 2016). Similar offset deals have been struck in Europe between national consortia and publishers that include Springer-Nature, Institute of Physics Publishing, Wiley and Taylor & Francis, highlighting the increasing prevalence of this model (Kai, 2016).

In August 2017, more than a year after more than 70 universities, institutes, and public libraries cancelled their contracts, German negotiators rejected the latest offer from Elsevier. The German consortium, called Projekt DEAL, demanded “a nationwide contract from Elsevier that includes fair pricing, OA in Germany to all papers authored by researchers at German institutions, and permanent full-text access to all electronic journals published by Elsevier” (Stafford, 2017). The Max Planck Digital Library (MPDL), the central library and licensing operation of the Max Planck Society—one of the world’s largest producers of scientific research and leader of the OA2020 initiative—announced that they, too, would join with the Projekt DEAL institutions and cancel their subscription to Elsevier journals until a satisfactory transformative model was agreed upon. Other major European consortia, including those in Hungary and Sweden, have also cancelled their subscription agreements with Elsevier. As of June 2019, these negotiations remain at a stalemate.

The cancellation of the UC system's \$11 million license with Elsevier in March 2019 represents the latest high-profile conflict for the future of scholarly publishing. Standing by the decision of the California Digital Library (the UC system's central licensing authority), Janet Napolitano, President of the UC claimed, "[t]his issue does not just impact UC, but also countless scholars, researchers and scientists around the globe — and we stand with them in their push for full unfettered access" (McKenzie, 2019).

### 1.7. The External Threat

The objective of the OA movement to liberate scholarship is a sharp departure from the predominant subscription system that has relied on publishers' ability to commodify knowledge and reap profits by restricting access to scientific literature. OA advocates, scholars and librarians alike have advanced numerous models for transitioning the system of scholarship toward the communal values of a knowledge commons, and through their persistent efforts over the past 15 years have made notable progress; yet over 70% of the world's scholarship remains paywalled, and largely under the control of oligopolistic publishers.

The most acute threat to the current system of scholarly publishing has come from Sci-Hub. Describing itself as "the first pirate website in the world to provide mass and public access to tens of millions of research papers," Sci-Hub was founded by a neuroscience researcher from Kazakhstan, Alexandra Elbakyan, to address the "frustration with the barriers that scientists face," especially in lower-resourced research institutions (i.e. in the Global South) in accessing research articles (Bohannon, 2016). With the sophistication of a silicon valley startup, Elbakyan, disrupted the subscription journal system through automated content piracy, permanently transforming the research information landscape.

Sci-Hub's presence has served as a wake-up call to the entire scholarly publishing community, not only due to the sheer volume of content it has made available but also the extent to which it is being used. An analysis of Sci-Hub's usage by John Bohannon published in May 2016 in *Science* magazine entitled, "Who's Downloading Pirated Papers? Everyone" raised alarm bells among scholarly publishers and university librarians alike. Data shared by Elbakyan demonstrated that Sci-Hub users were not limited to research communities in the Global South. Research institutions in the United States demonstrated significant usage (ranked 5<sup>th</sup> in terms of country-wide usage), and more than 25% of the total number of downloads were from institutions in OECD countries, with the wealthiest institutions and best-equipped institutional libraries. Even more jarring to the scholarly publishing community was that in the United States and Europe, much of the access was from university campuses, suggesting that users were choosing Sci-Hub over their libraries "for convenience rather than necessity" (Bohannon, 2016). This hinted that access through university libraries to content was far from universal, and that academic libraries—with their systems of credentialing and authentication of users, silo-ing of content, and limited search interfaces—were being dispensed for the efficient and comprehensive services offered freely through Sci-Hub. Given its vast corpus of content and increasing popularity with users, some now question whether the scholarly publishing industry is facing its "Napster moment," referencing the illegal music-sharing service that disrupted and triggered a massive restructuring of the underlying industry between 1999 and 2001 (Willinsky, 2017, p.1).

In an industry where the sales revenue from subscriptions forms the basis for financing the majority of scholarly publications, piracy on the scale of Elbakyan's Sci-Hub has perhaps predictably prompted some publishers to file legal suits against the website. Most prominently, the publishing conglomerate Elsevier filed suit against the company: first in 2015, and again in

2017. The New York District Court ruled in Elsevier's favor both times, first issuing an injunction against the site's operators in 2015; and in 2017 awarding the company a staggering \$15 million in damages for copyright infringement (Schiermeier, 2017). This legal action was soon followed by the filing of a legal suit against Sci-Hub by the American Chemical Society, asserting "infringement of [the society's] copyrights, as well as counterfeiting and infringement of its trademarks" (ACS, 2017). Yet neither case is likely to bring the publishers much satisfaction beyond favorable verdicts in court. Sci-Hub's infrastructure is international and dispersed around the world, including where Elbakyan now lives in Russia, beyond the jurisdiction of the US legal system.

While publishers are battling to establish the illegality of the service in the courts, many discussions are taking place around the morality behind the site and how it is a symptom of a failing publishing system. These arguments echo many of the voices in the OA community, who have argued for the advantages that an open system of scholarly publishing would deliver to the global scientific enterprise (Willinsky, 2006). Elbakyan herself, in response to the Elsevier suit filed against her, wrote a letter to the presiding judge Robert W. Sweet of the New York District Court, invoking the work of the OA pioneer John Willinsky in *The Access Principle*. Elbakyan claimed that "the general opinion in the research community is that research papers should be distributed for free (open access), not sold" (Oswald, 2017). Elbakyan's justification behind developing Sci-Hub was therefore not only practical, that is, as it was intended to solve her own issues with accessing scholarly articles, but was philosophical, reflecting the arguments made by the OA movement that scholarly knowledge was a public good.

Founders of the OA movement were quick to denounce the Elbakyan's methods, although one of the movement's most vocal advocates, Peter Suber, Director of the Office for

Scholarly Communications at Harvard University, acknowledged that “a lawsuit isn’t going to stop it, nor is there any obvious technical means. Everyone should be thinking about the fact that this is here to stay” (Bohannon, 2016). Although Elbakyan’s approach has not been wholly embraced by the OA movement, she hopes to accelerate its goal of barrier-free access to scholarly information, stating, “[T]he effect of long-term operation of Sci-Hub will be that publishers change their publishing models to support Open Access, because closed access will make no sense anymore” (Peters, 2016).

A study by Bastian Greshake showed that the usage of Sci-Hub closely reflects the oligopoly dominating the scholarly publishing industry. When analyzing the usage of the Sci-Hub corpus at the publisher level, 80% of all usage came from nine publishers, and close to 50% of the downloads of articles through Sci-Hub were published by just three companies, namely Elsevier, Springer-Nature, and the American Chemical Society (Greshake, 2017).

## 1.8. Research Questions

The current existential crisis for the scholarly publishing places the industry at a crossroads, between a status quo dominated by commercial publishers and marked by increased discontent by the academic community, and a potential future where OA is the prevailing model, establishing the status of knowledge as a public good, belonging in a global knowledge commons. Although some scholars believe the industry to have reached a historic “tipping point,” beyond which the conversion of scholarly publishing to OA models will accelerate rapidly (Archambault, et al, 2015), the mechanisms for achieving this transition have yet to be established.

Up to this point, the predominant model for OA has been the author-pays, APC-based model, used to fund gold OA through OA journals as well as research articles published in

hybrid OA journals. Institutionally supported APCs have served as the basis for transition arrangements for national offset license agreements. In much of these arrangements, the APC has been an economic addition to the prevailing subscription models adopted by commercial publishers, adding complexity, cost, and inequity to efforts to advance content to OA, as APCs have only proven themselves applicable in a handful of well-funded scholarly disciplines. What has been lacking are viable models to achieve the transition of subscription content to OA that will work equally well across disciplines and institutions. Given the promise of cooperative approaches between two of the major stakeholders in scholarly publishing, this thesis seeks to identify and evaluate the positions of librarians and publishers at this historic juncture in the future of scholarship by addressing the following research questions:

1. What distinguishes the positions of research librarians and scholarly publishers on open access to research and scholarship?
2. What are the points of convergence and divergence both within and across these two stakeholder groups in scholarly communication?
3. What do these positions and points reveal about these two stakeholders' perception of this academic knowledge economy both in a historical sense and with regard to its future into the digital era?

This thesis achieves this assessment by analyzing the responses of both sets of stakeholders to a specific instance of the knowledge commons in scholarly publishing, which is communal in spirit, but also a potentially viable business model. This model leverages the communal spirit of academia in the acquisition strategies of research libraries, and the interests of societies and publishers to advance scholarship and visibility of their published research, through a financially

efficient approach that advances research quality and supports innovation, while avoiding the necessary pitfalls, enclosure and commodification of the commercial model.

More specifically, this thesis advances the notion of a Subscription-Equivalent Transition (SET) in which the existing economics and transactional relationships between both stakeholder groups are sustained, but leveraged to change the outcome of the publishing process from purchasing paywalled access, to supporting OA publishing services. The SET model was formulated not only to demonstrate the potential of this kind of transformative approach but also to gauge the reaction of libraries and publishers to an OA model that so closely resembles the prevailing subscription model. Serving as a form of *Rorschach* test, I address the research questions of this thesis by analyzing the responses of both stakeholder groups to the SET: to identify their respective positions on OA, highlight issues of divergence and convergence between the two stakeholder groups, and what this analysis tells us about the knowledge economy at this critical moment in its history. The existing body of research on assessments of the state of OA—particularly the work of Archambault et al. (2015), Björk (2003, 2013, 2017), and more recently Piwowar et al. (2017,) described in more detail in the subsequent chapter—have all focused on automated, quantitative methods for measuring the progress of OA. This work is intended to complement these studies with a qualitative assessment of OA, focusing on the attitudes of librarians and publishers as key stakeholders in understanding the present, and potential future, of scholarly communications.

Through this thesis I aim to provide a greater understanding of the positions of librarians and publishers, which may help to bridge at least some of the points that divide these two key stakeholder groups. The hope is that this might promote greater mutual understanding and cooperation to foster an intellectual commons suited to the digital age. This study forms a

component of the Open Access Publishing Cooperative Study of the Public Knowledge Project (PKP), a two-year MacArthur Foundation supported initiative to assess the feasibility of cooperative approaches for OA.

I approach this work both as a scholar and publisher of journal content. During the course of this research, and inspired by my advisor's work, specifically on the theme of "subscribing" to open access (Willinsky, 2017), I have designed (in collaboration with Raym Crow) and implemented a collective OA transition model called *Subscribe to Open* at my employer, the nonprofit publisher Annual Reviews. Informed by the research conducted in pursuit of this thesis, as well as the preliminary results of this work, the Subscribe to Open model seeks to maintain existing transactional relationships between the publisher and subscribing libraries, with the subscription revenue being used to publish the journals OA. While still in a preliminary or pilot stage in its implementation, the Subscribe to Open model leverages the library community's strong philosophical commitment to OA for scientific research, but also motivates collective action through a model that is designed to be in each subscribing library's own economic self interest. The model is designed to avoid many of the pitfalls of OA transitional models described in this work, while seeking to enable meaningful cooperation between publishers and subscribing libraries to deliver a sustainable path towards OA, although it is still too early to establish if it has achieved those goals



## Chapter 2: Literature Review

### 2. Context

For much of the history of modern scholarship dating back to the birth of the scholarly journal—the values of academia have peacefully coexisted with market forces. Following in the tradition of their monastic predecessors, academic libraries have served as the primary custodians of the intellectual commons, and worked cooperatively with scholarly publishers in supporting the production and distribution of scholarly works. As described in Chapter 1, both sets of stakeholders have worked to balance the interests of scholarship with commercial viability. In the past few decades, the scales have tipped heavily in favor of commercial actors, who seized upon opportunities distinct to the industry to gain monopolistic control and reap significant profits, to the detriment of academic libraries and scholarship as a whole. Monopolistic control has increased in recent years despite the potential for digital technologies to radically transform the way scholarship is produced and distributed. With the rise of OA business models challenging the commercial enclosure of the knowledge commons, and the threats to the prevailing subscription model from digital piracy, the scholarly enterprise finds itself at a historic moment.

This thesis seeks to understand the positions of two of the major stakeholders in the scholarly publishing ecosystem, as they make sense of the paradigm shift enabled by digital communications. To gain an appreciation of the economic forces that are likely to shape the stakeholders' positions, I review the research literature describing the commodification of knowledge, as well as the powerful challenge delivered by scholars of the knowledge commons.

Understanding the positions of publishers and librarians on the state of scholarly publishing necessitates an appreciation of the economics of the industry. I describe the research

relating to the distinct economics of scholarly publishing, its commercial exploitation, and the rise of the OA movement as a response, capturing the balancing of the values of commerce against the communal. Informed by the review of economic models and literature on the current state of OA, I describe how the current body of research work in OA fails to adequately address the specific values and positions that are guiding librarians and publishers as they navigate through the current impasse in scholarly publishing.

This chapter is supplemented by Appendix A, which provides a more detailed review of the research that has been conducted on OA publication models, in particular exploring how the values of commercial publishers who dominate scholarly publishing industry have impinged upon the communal values of the knowledge commons with their embrace of OA publishing. I review the various approaches that have been highlighted in the research to support the transition of subscription content to OA, as well as pitfalls and critiques associated with these approaches.

## 2.1. The Knowledge Commons and the Commodification of Knowledge

As detailed in Chapter 1, the idea that knowledge associated with scholarship and learning belonged in a commons and was not to be treated as a commodity has strong historical roots, dating back to the Middle Ages. These values were the bedrock of the medieval monasteries and university libraries, where they sought to foster communities to advance learning. Thomas Bodley's insistence that the public be allowed access to the Bodleian Library serves as another example of how historically the intellectual commons were sustained by sponsorship or endowment, while reconciling or leveraging commercial forces.

Over the past half-century, however, scholars—beginning with Harold Demsetz in the mid-1960s—have launched a crusade against the viability of the broad concept of the commons (Demsetz, 1966). The most influential of these works was an essay published in *Science* in 1968

entitled “The Tragedy of the Commons” by Garrett Hardin. Hardin described the fate of a pasture that was held in common as being doomed to ruin: subjected to exploitation by individual self-interested herders at the expense of the community. Describing how rational egoists are unlikely to succeed in advancing the common interest, without “enclosure” or propertization, tragedy would inevitably ensue: “Ruin is the destination toward which all men rush, each pursuing his own best interest in a society that believes in the freedom of the commons. Freedom in a commons brings ruin to all” (Hardin, 1968). Hardin’s work made him a champion of the environmental movement, by applying his conceptual model to human population growth, the use of natural resources, and the welfare state.

The popularity of Hardin’s work—to date garnering more than 39,000 citations—shaped much of the discourse in ecology, economics, political science, and environmental studies for decades. Applied to the knowledge commons, Hardin’s viewpoint advanced the notion that enhanced property rights lead to greater prosperity and productivity. Applying Hardin’s philosophy, all commons were considered suboptimal and inefficient, and the commodification of resources in the public domain was aggressively advanced—as exemplified by the enclosure of scholarly works by commercial publishers (Landes & Posner, 2003).

Yet Hardin’s work was grounded on more than skepticism of the ability of people to work collectively in delivering a public good due to rational self-interest. According to the Southern Poverty Law Center, Hardin used his platform as an academic to advance anti-immigrant, white-supremacist, and eugenicist ideologies, providing a “veneer of intellectual and moral legitimacy for his underlying nativist agenda” (SPLC, 2019). Furthermore, Hardin’s work made him no friend to the environment: his views against collective provision of public goods were used to move public lands into private ownership or stewardship, ultimately leading to

devastating levels of natural resource exploitation. Ecologists have subsequently turned against Hardin as well, instead pointing to evidence of the viability of communal resource management (Feeny, et al., 1990).

Hardin's pernicious viewpoint—once considered natural and logical, but now exposed as motivated by his extremist political ideology—has since been soundly challenged. First off, his historical account of the exploitation of the commons was not adequately grounded in fact: early pastures were well regulated and maintained by local institutions (Cox, 1985). Furthermore, his thesis has been countered by scholars (Hess & Ostrom, 2006; Bollier, 2007) who argued that although the risks of the tragedy of the commons are real, its failure is not a foregone conclusion, as Hardin assumed. Elinor Ostrom, Nobel laureate in Economics, provided the intellectual antidote to Hardin's toxic ideology. Her book, *Governing the Commons*, provides specific instances and examples on how the management of common resources can provide for a better, more prosperous, and more egalitarian future (Ostrom, 1990). She demonstrates that group control over resources does not inevitably lead to overuse or exploitation, and communities are able to develop effective arrangements and institutions to manage common-pool resources, based on trust, cooperation, and reciprocity. This position is supported by the example of the library as the historical knowledge commons, and is being extended to counter the trend of commodification of scholarship to establish a new knowledge commons for the digital era.

Since the dawn of the digital revolution, scholars of the commons have questioned whether copyright law appropriately balanced the protection of intellectual property with incentives for creation and the access, dissemination, and collective production of knowledge. Modern technologies have transformed the paradigm of communication of information and

raised questions on whether prevailing intellectual property frameworks are most effective for the overall benefit of society (Boyle, 2009).

Referring in part to the increased control over scholarship by commercial publishers, scholars such as Yochai Benkler have argued that “we are in the midst of an enclosure movement in our information environment” (Benkler, 1999, p.354 ). Similar to the first enclosure of the natural commons in Europe in the sixteenth century by the state and landowners, and prompted by ideologies matching that of Hardin, the expansion of intellectual property rights has resulted in a second enclosure movement, this time in the knowledge commons (Boyle, 2003). The increased property rights and the resulting transfer over the control of knowledge to media conglomerates including large commercial publishers—as opposed to being retained by the knowledge creators, the individual scientists and authors—is described by Drahos and Braithwaite (2002), using a similar medieval analogy, as “information feudalism.” Enabled by digital technologies, the commodification of information has led to a new digital “land grab” (Samuelson, 1998) by capturing and commercializing information such as online behavioral data or genetic information that had no value in the old economy (Hugenholtz & Guibaldt, 2006). With regard to scholarship, Ostrom and Hess warn that “this process of enclosure leads to speculation that the records of scholarly communication, the foundations of an informed, democratic society, may be at risk” (Ostrom & Hess, 2003, p. 112). Their research sets out a central issue addressed in this thesis, i.e., that of the commodification of research information by scholarly publishers, and how this form of commercial enclosure of a public good impinges on the values and potential benefits of knowledge as an intellectual commons.

The extreme propertization and commodification knowledge that has transpired since the dawn of the digital revolution—with the example of oligopolistic control over scholarship—

seems to run counter to the values of the networked information society. David and Rubin argue that society is incurring drastic opportunity costs through the propertization of knowledge, as a thriving, networked, digitally enabled knowledge commons has greater potential for the advancement of science (David & Rubin, 2008). Elinor Ostrom's work strongly advocates against the path to propertization of the commons (Ostrom, 1990) and provides numerous examples to demonstrate how public resources can be well managed and regulated, given the right governance structures are put into place (Feeny, Berkes, McCay & Acheson, 1990; Bromley, et al., 1992; Hess & Ostrom 1996). With appropriate governance, Carol Rose argued that the "comedy of the commons" can ensue, i.e., where a resource becomes more useful when increasing numbers of people use it (Rose, 1986). This is particularly considered true for the knowledge commons (Madison, et al., 2009), as knowledge is a nonrivalrous public good whose utility can be increased through increased use, reference, and contributions (Lessig, 2006). Instead, the underuse of a commons can result in the tragedy of the anticommons, where excessive property rights on intellectual resources result in socially suboptimal use of scientific knowledge (Heller, 1998).

Beyond offering examples of the management of common resources, Ostrom and Hess (2003) offer useful tools for assessing emerging models for creating and delivering information resources that are both manageable and sustainable. The underlying feature of these models is that they leverage shared values to provide free and open access to public resources, and facilitate cooperation to ensure their sustainability (Hess & Ostrom, 2003). This research inspires the contribution I aim to make in this thesis, to gain an appreciation of the current positions of librarians and publishers toward building such cooperative models, based on the alignment of values, to manage and sustain a vibrant knowledge commons.

Powerful examples of communities of social trust—for example the open source software (OSS) movement, Creative Commons, and Wikipedia—have demonstrated that cooperative behavior, once limited to rarified groups, can operate successfully on a large scale (Hyde, 2007; Willinsky, 2005; Merton, 1973). Benkler details this in *The Wealth of Networks*, where he describes that “radical decentralization of intelligence in our communications network and the centrality of information, knowledge, culture, and ideas to advanced economic activity are leading to a new stage of the information economy—the networked information economy” (Benkler, 2006, p.23 ). The digitally enabled network environment is able to leverage distributed and collective intelligence and process information at unprecedented speed. In this networked environment production becomes “radically decentralized, collaborative, and nonproprietary; based on sharing resources and outputs among widely distributed, loosely connected individuals who cooperate with each other without relying on either market signals or managerial commands. This is what [Benkler calls] ‘commons-based peer production’” (Benkler, 2006, p.60). In this kind of networked information economy, OA to scholarly research would not only enhance the wealth of the network, but would help accelerate and enable positive social externalities that result from scientific activity.

## 2.2. The Economics of Academic Publishing

This section sets out the research on a series of issues taken up by this thesis, describing the distinctive economics of academic publishing, and how the balance of commerce and commons has tipped heavily in favor of commercial forces.

The traditional subscription model of scientific publishing is based on the enforcement of publisher-held copyright. In this model, access is provided to readers following the payment of a fee, with limited use and reuse rights for most forms of subscription-based content. According to

Müller-Langer and Watt (2010), “since a positive fee, over and above marginal access cost, is charged for access to the content, this content is accessed to a socially inefficient level.” This market inefficiency is typically justified by claims that copyright protection provides appropriate incentives for the creation of new knowledge. OA advocates argue that scholarly incentives are distinct: academic research is typically publicly funded, and researchers are motivated by reputational incentives, as opposed to the specific financial incentives protected through traditional copyright.

The market for academic journals—which form the primary medium for communication of scholarly results—is distinctive in that both the demand and the supply of content is provided by the research community (McCabe & Snyder, 2004). The customer and principal audience of academic journals is the scholarly community: who conduct the research and generate research outputs in the form of journal articles. Furthermore, the core functions of peer review and editorial selection are also typically performed by members of the research community, whose contribution is provided on the basis of communal values, but also in exchange for the prestige associated with performing that function (McGuigan & Russell, 2008). In this form of circular model, academic publishers facilitate the task of publishing, facilitate peer review (which is provide free by scholars), and consolidate research articles into journals that are sold back to researchers via subscriptions. As described by Bergstrom, scholarly publishers benefit from the communal values of the academic community, as well as the reputational incentives of the academic system to gain “free labor for costly journals” (Bergstrom, 2001).

As established in Section 1.2, the unusual economics of academic publishing, and the weighing of commerce and communal, have only in recent decades reinforced the perceived inequities of the system. Since Oldenburg’s day and until the mid-twentieth century, profit was



not among the principal drivers of academic publishing (Guédon, 2001). Lacking expertise in publishing, scientific societies transferred copyright to professional publishers, reconciling their values to distribute knowledge as widely as possible with the values of commercial publishers that were most adept at this task. This enabled societies to profitably outsource their publishing activities and focus on their respective missions. The increased commodification and commercial control of academic publishing began to generate significant profits for publishers, who shared these benefits with their societies who became increasingly dependent on these revenues from publishing to support their activities (Reichman & Okedji, 2012). The allure of these profits led to increased corporate consolidation in the publishing market, as scientific societies increasingly outsourced their publication activities or allowed themselves to become acquired by commercial conglomerates (Edwards & Shulenburger, 2003). This trend of corporate consolidation, beginning in the 1970s, peaked during the 1990s but continues to this day.

The establishment of the Science Citation Index (SCI) provided a signal to commercial publishers that the demand for indexed journals by the scholarly community would be significant. They targeted their acquisition activities on the scientific societies publishing journals indexed in the SCI, with the societies reconciling this acquisition with the revenue gains to support their communal activities (Guédon, 2001). Given that scientific journals are not readily substitutable, as they each publish unique scientific content, these factors combined to create the inelastic market in journal publishing. Through aggressive pricing strategies and corporate acquisitions, commercial publishers began to gain monopolistic control, delivering large profit margins to their shareholders—and tipping the balance toward the forces of capitalism and against the communal values of academia.

Willinsky describes how the scholarly publishing market is stratified, consisting of three distinct markets, namely commercial publishers, learned association and society publishers, and independent publishers (Willinsky, 2009). According to a report by the International Association of Scientific, Technical and Medical Publishers (STM), the total size of the market (including all forms of research outputs: journals, books, databases, etc.) was estimated at \$25.7 billion, with journal revenue consisting of about 40%, or around \$10 billion (Johnson, Watkinson & Mabe, 2018).

Citing Ulrich's web directory of journals as their source, the STM report identifies the English language journal market as consisting of 33,119 publications (with 9,372 non-English language journals). These journals publish an estimated 3 million research articles per year. According to Johnson, Watkinson and Mabe (2018) the annual growth rate of articles and journals has held historically steadily at 3% and 3.5% per year respectively for the past century. However, in recent years this rate of growth has accelerated owing to increased global R&D investments (driven primarily by growth in China), to 4% annual growth for articles and 5% annual growth in the number of journals.

Corporate consolidation through mergers of publishing houses and acquisition by publishing conglomerates have resulted in oligopolistic conditions in the scholarly publishing industry (Larivière et al., 2015), i.e., conditions in which a small number of large commercial entities control the majority of the scholarly publishing market (McCabe, 2005; Foer, 2004; Susman & Carter, 2006). As I describe in the following section, these market conditions have led to commercial pricing models that are increasingly untenable for academic libraries. Not only does this market fail to reap the capitalist benefits of competition on pricing, it does not deliver on the core values of the scholarly enterprise on which it is founded. By reviewing the literature

from the perspective of libraries and publishers, I provide context for the consideration of an alternative open access model that falls well within the history and legacy of scholarly journal publishing.

### 2.2.1. Pricing and Inelastic Demand

The most well-documented point of conflict between libraries and publishers to date has been related to the pricing practices of publishers (King & Alvarado-Albertorio, 2008). Academic publishers have traditionally treated subscription income from academic libraries as their primary source of income (McCabe & Snyder, 2007). However, pricing strategies with aggressive increases in the price of journals have perpetuated the serials crisis at academic libraries, who have struggled to uphold their role as custodians of the knowledge commons at their institutions. With largely flat budgets, libraries have been unable to sustain subscriptions to important scholarly journals (McGuigan & Russel, 2008; Okerson, 1996) owing to price increases that have grown faster than the rate of inflation imposed by publishers with monopolistic control over content (Lewis, 2007). According to the European Commission:

Over the last twenty years, journal subscription prices have on average increased above inflation level—according to one study 4.5% per year above inflation—while there are considerable differences according to disciplines and journals. This has put publicly funded libraries, their main clients, under financial pressure and led to subscription cancellations in certain cases. (EC, 2007)

As described, the inelastic demand for non-substitutable scholarly journals has created a market that has become subject to commercial exploitation (McCabe, 2004). This situation has placed commercial publishers in an advantageous position, as they have gained monopolistic control over titles that are considered essential for journal collections in academic libraries. In this

market, commercial publishers “acquired top-quality journals, and then dramatically raised prices, expecting they would lose relatively little of that market” (Edwards & Shulenburger, 2003). A study of the pricing practices of publishers conducted by Bergstrom and Bergstrom (2004) found that the subscription rates charged by commercial publishers exceeded those of nonprofit and society journals by three to nine times. These increases have been exacerbated by the monopolistic control resulting from mergers and acquisitions by scholarly publishing conglomerates. According to studies by McCabe, significant price increases have followed corporate acquisitions of journals (McCabe, 1999; 2002).

In the 1990s, academic publishers—particularly large commercial publishers—initiated the practice of bundling journals into “Big Deals,” and selling these large packages to libraries at a discount off the total list price of their journals. The initial popularity of these deals resulted in big deals becoming a dominant sales practice in the scholarly journal market. For libraries, these deals provided the benefit of scale: by securing a small number of big deal contracts, they were able to secure access to a large volume of titles at a lower price per title as opposed to purchasing access a la carte. Managing fewer contracts with larger publishers also likely resulted in administrative ease and efficiency on the part of libraries. For publishers, the big deal strategy allowed them to gain access to greater revenue streams than a la carte purchases from libraries could ever secure.

Although at the outset big deals were considered mutually beneficial, in recent years—particularly following aggressive annual price increases ranging from 5-15%, and significantly exceeding the growth of library budgets—their value has come into question. Publishers have justified price increases by the addition of numbers of specialized journals launched; however, the net effect on libraries has been that larger chunks of their budgets have been consumed by

big deals with the largest commercial publishers (SPARC, 2019). The result of this greater consumption of library budgets by corporate entities has not only bolstered their market position, but has also squeezed smaller independent and nonprofit publishers out of the market, as libraries are left with limited funds to subscribe to additional journals (Willinsky 2009). This situation also represents a strategic barrier to entry into the market for new journals and publishers (Edlin & Rubenfield, 2004).

Publishers have accompanied the bundling of journals with the implementation of tiered pricing structures. Particularly applied to subscription access to online journals, academic publishers have developed pricing structures in which large university libraries pay significantly more than smaller institutions for site licenses (which provide access to designated institutional campus networks). In effect, these pricing schemes have been set by publishers on customers' willingness to pay, as opposed to being based on the costs of production of their journals. The prevalence of nondisclosure clauses in publisher licenses results in a lack of transparency in pricing and significant levels of price-discrimination, with customers unable to compare the price each may have paid for the same content (Bergstrom & Bergstrom, 2004).

For commercial publishers in particular, these pricing models have led to large profit margins, that are "unusually high figures rarely found for firms in other industries" (McGuigan & Russel, 2008). According to a study by researchers at the University of Montreal, the profitability of the largest academic publishers has steadily increased in recent years despite the corresponding advent of the OA movement: Elsevier increased its profit margins from 30.6% to 38.9% between 2006 and 2013, Springer Science and Business Media reached similar high profits of 35% in 2012, Taylor & Francis saw profits of 35.7% in 2013, and John Wiley's STEM

division saw profits of 28.3% in 2013 — margins that exceed those of many of the world's most profitable companies (Larivière et al. 2015).

Applying microeconomics and statistical theory to pricing models for both commercial and nonprofit publishers, Bergstrom and Bergstrom (2004) found that for journals that are priced to maximize profits (i.e., for commercial publishers), academic libraries were likely to be worse off when compared with purchasing single-journal subscriptions. They contend that consortial negotiations, in which libraries work collectively negotiate better pricing, might serve as a potential solution to bring subscription prices close to the costs of production:

Libraries face a collective action problem. If all were to refuse to buy site licenses to the expensive commercial journals, publishers would have to cut prices and all would benefit. However, each individual library would better serve its patrons by purchasing a site license despite the cost. Some sort of coordinating mechanism among libraries could facilitate a collective response to this problem. (Bergstrom & Bergstrom, 2004)

Although libraries (at the regional, national, and international level) have organized themselves into consortia to gain economies of scale and leverage in purchasing, this has ironically benefitted publishers by ensuring larger total incomes and access to broader markets, while lowering their sales and negotiation costs. The kinds of coordinated cancellation efforts proposed by the authors have started to emerge, not only to cut prices but also to enter into OA arrangements.

In contrast to commercial publishers, Bergstrom and Bergstrom's study found that journal site licenses from nonprofit publishers (scientific societies, scholarly associations, university presses, and independent nonprofit publishers) were broadly beneficial to the scientific community (Bergstrom & Bergstrom, 2004). Their analysis is particularly pertinent to this thesis,

as the authors help to establish that the commercial route of pricing of scholarly journals is not only providing poor value for money, but is also suboptimal for the scientific community when compared with pricing practices of nonprofit publishers.

Although the study by Bergstrom and Bergstrom (2004) does not explicitly address OA, its economic consequences can be inferred. For OA journals to be sustainable, they need to effectively be able to recover costs, and average-cost pricing can be used to calculate the minimum revenues needed from sources other than subscriptions. Their study suggests that substantial savings would accrue to the academic community by eliminating profit-maximizing pricing strategies. Because of the absence of administrative costs related to subscription maintenance and the added costs of paywalls and systems of authentication, average-cost pricing for OA journals should be even less than that of nonprofit subscription models (Bergstrom & Bergstrom, 2004).

An objective for this thesis is to determine how publishers and libraries can collaboratively advance the cause of achieving a scholarly communications landscape dominated by OA. Gleaning the perspective of publishers on their pricing models as described in the literature can therefore help to inform their position with regard to their commercial practices. According to an extensive review of the literature relating to the pricing of scholarly journals, King and Alvarado-Albertoria (2008) identify a number of factors that have led to the upward trend in pricing for journals. These include an increase in the number and size of journals, the cost of publishing resources that have increased at rates that exceed inflation, the costs for electronic publishing and value-added services, the high subscription charges necessary to be financially viable for journals targeting small specialized audiences, the flattening of library budgets while meeting commercial demands, the exercise of monopoly and market power to

charge higher prices, and larger overhead costs requiring larger publishers to charge more (King & Alvardo-Albertorio, 2008).

Beyond these factors, the International Association of STM Publishing also cites the costs associated with the process of quality assurance, i.e., journal peer review, and particularly note that typically journals that are of higher quality have higher submission rates, and consequently rejection rates, each of which place a substantial burden on publishers. In defense of the high surpluses and profits generated in scholarly publishing, the Association cites that “profits are a major source of reinvestment and innovation” and enable publishers to make “investments in the development of new journals around which emerging scientific communities seek to coalesce” (Ware & Mabe, 2008). As already mentioned, scientific societies use publishing surpluses to fund a range of society activities, including research and travel grants, scholarships, conferences, and community engagement (Thorn, 2009).

A study conducted by Deutsche Bank (2005) and commissioned by Elsevier’s parent company, RELX highlighted the profit margins generated by their publishing operation, and questioned its justifications:

In justifying the margins earned, the publishers, REL included, point to the highly skilled nature of the staff they employ (to pre-vet submitted papers prior to the peer review process), the support they provide to the peer review panels, including modest stipends, the complex typesetting, printing and distribution activities, including Web publishing and hosting. REL employs around 7,000 people in its Science business as a whole. REL also argues that the high margins reflect economies of scale and the very high levels of efficiency with which they operate. We believe the publisher adds relatively little value to the publishing process. We are not attempting to dismiss what 7,000 people at REL do



for a living. We are simply observing that if the process really was as complex, costly and value-added as the publishers protest that it is, 40% margins wouldn't be available.

(Deutsche Bank AG, 2005, p.36)

Highlighting the lack of transparency in publisher pricing and its relation to value, Willinsky and Moorhead conclude that commercial publishers fail to demonstrate “any acknowledgment that these same publishing services are being provided at far less cost by the academic community itself” (Willinsky & Moorhead, 2014). Having established the underlying economic forces and conditions that characterize the commercial dominance of academic publishing, this thesis turns to describe the dynamics of the OA movement, and the body of existing research that informs the responses of librarians and publishers to this phenomenon.

### 2.3. Open Access Publishing

Over the last 15 years the OA movement has made traditional publishing houses and venues less indispensable (Armbruster, 2005; Reichman & Okediji, 2012; Willinsky, 2005). According to Willinsky, “there is a growing recognition within the academic community that open access to research and scholarship can increase its value and reach” (Willinsky, 2005). Rather than being considered solely as a response to the commodification of knowledge and the serials crisis, Reichman and Okediji (2012) urge a consideration of “the wisdom of continuing to rely on proprietary publishing intermediaries in an environment increasingly characterized by an array of promising open access options.” They urge that “the best outcome for the future of scientific research may well be for the scientific community itself to take responsibility for managing the conditions under which its own knowledge assets will be created and deployed” (Reichman & Okediji, 2012).

In her work investigating the “Economics of Open Access Law Publishing”, Jessica Litman (2006) urged that rather than focusing on the economic models for OA, it is worth considering whether OA would “engender a less dysfunctional environment for scholarly publishing than the one we currently enjoy” (Litman, 2006). Citing the fact that publication costs, whether subscription or OA, are but a mere fraction of the total investment in the research enterprise itself, it is likely not even consequential to focus on the specific cost-savings that might accrue from new OA business models. Enabling OA might simply “require research centers to shift some of their expenditures from column A to column B” (Litman, 2006). But the act of making research itself more accessible, even in the absence of any cost savings “seems likely to improve the quality of scholarly research across the board, and seems worth doing on those grounds alone” (Litman, 2006). Litman’s research supports and calls for the work presented in this thesis: a survey of the responses of libraries and publishers to a commons-based alternative model for OA that can be implemented for the research enterprise at large, but is scalable to be implemented at the journal, publisher, or discipline-level.

Despite the promise of OA for improving scholarship described in the work of Litman (2006), Willinsky (2005), Reichman and Okediji (2012)—to highlight but a few—the academic community is left to contend with the majority of scholarship that remains behind subscription paywalls; which the most recent estimates place at 72% of all published academic articles (with digital object identifiers, DOIs)(Piwowar, et al., 2018). Furthermore, while a central objective of the OA movement has been to counter the increased enclosure and control of scholarship by commercial publishers, these publishers have embraced OA business models—with the world’s two largest commercial publishers, Springer Nature and Elsevier, seemingly competing for the title of “world’s largest open access publisher” (Morrison, 2016). Their embrace of OA is based

primarily on a business model involving the payment of an author fee, or APC, levied against corresponding authors or their institutions. In their study, “The state of OA: a large-scale analysis of the prevalence and impact of Open Access articles”, Heather Piwowar and others chart the progress of OA, while also demonstrating how much further the movement has to go. Figure 2.1 below from this study demonstrates the continued dominance of the commercial publishing sector—representing the top 6 publishers (and 11 of the top 20), and by far accounting for the greater volume of published content (Figure 2.1.A). Although these publishers have all adopted OA models (of varying forms, the distinctions of which are described in Appendix A, Section 1), the majority of published research (as demonstrated in Figure 2.1.B.) remains “closed,” or behind a subscription paywall (Piwowar, et al., 2018).

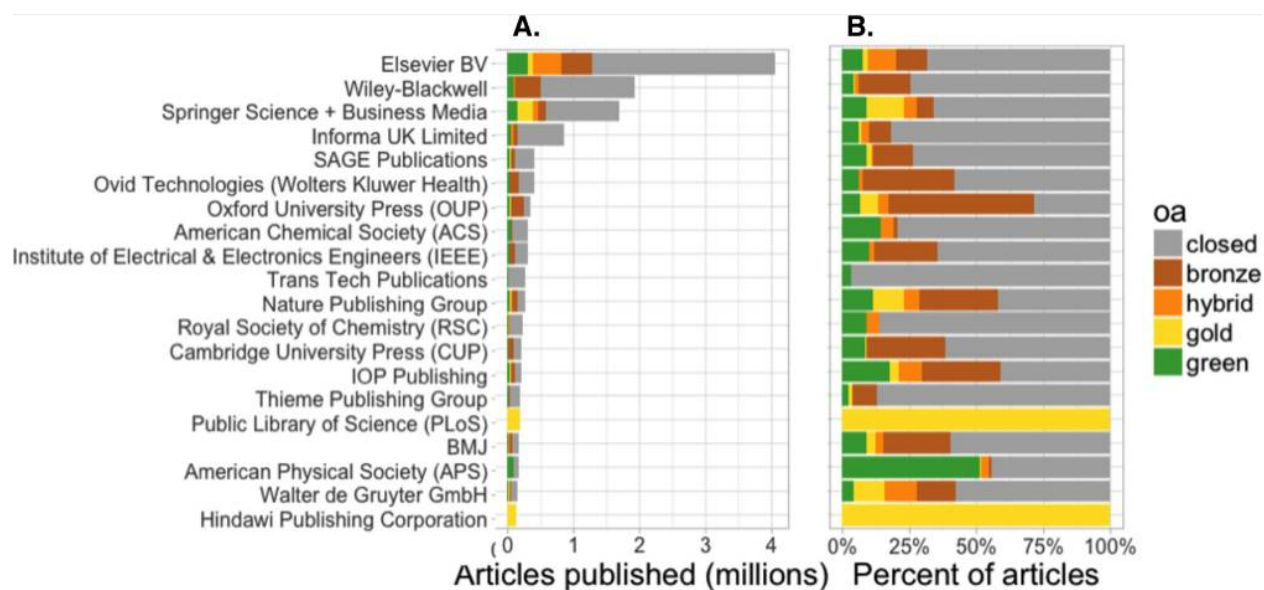


Figure 2.1. Number (A) and proportion (B) of articles with OA copies, by publisher, for the 20 most prolific publishers. Based on sample of 27,894 Crossref DOI-assigned articles published between 2009–2015. (Source, Piwowar et al., 2018)

The dominance of the commercial publishing sector has been reinforced by institutional incentive structures that prioritize the publishing of research in journals indexed in the major citation databases, particularly those with “impact factors” assigned by the Web of Science Journal Citation Report (JCR). These reputational incentives strengthen the market positions of commercial publishers, and further represent a challenge to new entrants into the journal market. For new journals, prestige can take time to build, placing newer OA publications at a disadvantage (Björk, 2013). Second, the stringent inclusion criteria, and specific methodologies of the Web of Science require that journals be indexed for a number of years prior to being assigned an impact factor, further magnifying the disadvantage. Despite these constraints, studies have demonstrated a dramatic growth in the indexing of OA journals in the Web of Science in the past decade, increasing from around 200 OA journals in 2003 to more than 600 in 2013 (Solomon, Laakso & Björk, 2013). Furthermore, a study by Björk and Solomon found that “OA journals indexed in Web of Science and/or Scopus are approaching the same scientific impact and quality as subscription journals, particularly in biomedicine and for journals funded by article processing charges” (Björk & Solomon, 2012). The growth in OA, even within the “core journals,” and their establishment as leading titles in some disciplines indicates that OA is having a transformative effect on scholarship, and establishes the need of the work pursued in this thesis for stakeholders to reconcile themselves to this growing phenomenon.

Despite research demonstrating the transformative effect of OA on scholarship, the continued commercial dominance of scholarly publishing in the face of the recognition of the potential benefits of OA suggests that scholarly communications is experiencing a tragedy of the anticommons, where the corporate ownership of large segments of the landscape is leading to the underuse of academic knowledge, frustrating the most socially optimal outcome (Heller, 1998).

## 2.4. Assessing the Value and Metrics of OA Publishing

The preponderance of scholarly work assessing the value of OA suggests that the conversion of publishing outputs to OA—and transition of publishers away from selling content to delivering OA services—is indeed the more socially desirable outcome, one that should be considered integral to the future of scholarship. A review of the literature that assesses the metrics and value of OA compared to the subscription pricing model highlights a number of streams of interest in the research, specifically: the social and economic impacts of OA, the effect of OA on readership, the research impact of OA publication, and the quality of research outputs.

### 2.4.1. Social Economic Impact of OA

The OA and, more broadly, the open science movements are founded on the principles that the free and open dissemination of research results is likely to accelerate scientific progress and innovation and have positive social and economic impacts. This open paradigm results from treating knowledge as a public good (Stiglitz, 1999), which should exist in a knowledge commons and not be subject to commercial enclosure. Yet the social and economic benefits of OA have been difficult to quantify. In an extensive literature review conducted by Tennant and others (2016), the authors concluded that OA had a favorable impact through increased dissemination and use of scholarship, that there were benefits to research and innovation-intensive businesses, and that OA could help foster “stable research ecosystems” (Tennant, et al., 2016).

Other studies have considered that author-facing OA business models, combined with self-archiving, could lead to financial savings (Houghton, de Jonge & Oploo, 2009; Houghton, et al., 2009; Houghton & Oppenheim, 2010). For example, a study conducted by the Research Information Network (2008), found that if 90% of all published articles were covered by author

fees, the total savings to the system would be approximately GBP 560 million, across both publishers and librarians. The concern, however, is that these costs would be disproportionately spread across institutions, with the result that research intensive institutions—such as the UC system—would end up paying more than they currently do in subscriptions (Smith et al., 2016).

Making an appeal to address the tragedy of the anticommons in scholarly communications, Adams (2007) argues that studies of the economic impact of OA on scholarly publishing do not adequately address the opportunity costs of not moving to an open science system. He suggests that the research has ignored the “constant and huge loss of efficient communication between scholars, and in particular the stifling of innovative interdisciplinary research and cross-discipline synergy of research” (Adams, 2007).

#### 2.4.2. Impact on readership

One of the fundamental benefits of OA is the potential for increased readership by removing the financial barrier to accessing scholarly research. As even academics with access privileges to library resources can appreciate, accessing subscription articles can be challenging, particularly when accessing content from off-campus. OA effectively eliminates all barriers to access and improves discoverability, with the unsurprising result that OA journal content is more widely read than subscription based journals (Davis & Walters, 2011). The transition to OA has resulted in increased downloads in virtually all related studies. Expanding readership is an important goal for transitioning to OA: wider readership has the greater potential for scientific and social impact of research, and for the authors, can improve the likelihood of being cited.

### 2.4.3. Increased Scientific Impact

Given that one of the most popular conventional measures for assessing research impact is citations, it follows that scholars would seek to measure whether OA publishing is optimal for science by tracking the impact of transitioning to OA on citations. In the first study to suggest that OA would provide a citation advantage, Lawrence (2001), studying around 120,000 computer science articles found that on average, OA articles were cited around 2.5 times more than those that were non-OA (Lawrence, 2001). A number of other studies have demonstrated increases in citations resulting from OA publication—termed the Open Access Citation Advantage (OACA)—with distinct variability across disciplines (Antelman, 2004; Hajjem, Harnad & Gringas, 2006; Norris, Oppenheim & Rowland, 2008). In a study of more than one million articles that had been normalized to account for the variability across fields, researchers found an OACA of 40% (Archambault, et al., 2014). A meta-analysis of more than 70 studies on the OACA conducted by McKiernan and others (2016) found that 66% demonstrated a positive OACA, while 25% found no OACA, with 10% leading to an inconclusive result (McKiernan, et al., 2016). Despite strong evidence for the OACA, the extent of it remains variable (Tennant, et al., 2016).

Studies demonstrating the OACA have been criticized for their methods (Davis & Walters, 2011). For example, an alternative explanation for the OACA is suggested by Gargouri and others, who attribute it to a possible self-selection bias. They argue that researchers and funders might be publishing content OA that they believe might be more impactful: “for the more citable articles, not because of a quality bias from authors self-selecting what to make OA, but because of a quality advantage, from users self-selecting what to use and cite, freed by OA from the constraints of selective accessibility to subscribers only” (Gargouri, et al, 2010).

Nevertheless, the large-scale study on the progress of OA published in 2018 by Piwowar and others, found that OA articles received 18% more citations than average (Piwowar, et al., 2018); and a more recent work demonstrated that OA journals are achieving higher impact factors at a faster rate than subscription or hybrid journals (Pollock & Michael, 2018). Despite disputes on the magnitude of the OACA, its variability across disciplines, and the methodological concerns of some studies, a growing number of scholars believe that subscription journals are not cited as frequently as their OA counterparts (Piwowar, et al., 2018). This growing body of evidence lends more weight to arguments for OA as the most socially optimal mechanism for the communication of science.

#### 2.4.4. Quality of Research and Peer Review

The growing body of evidence suggesting that OA communication is not only socially optimal, but can support readership and scientific impact has been undermined by claims that OA can have a potentially detrimental impact on scientific quality. In particular, concerns relating to the rigor of peer review in OA journals have plagued the OA movement since its outset (Oppenheim, 2008). Commercial publishers in particular have contended that OA journals lack rigorous peer review processes, so the resulting quality of research published is diminished in comparison with traditional journals, for example:

By introducing an author-pays model, Open Access risks undermining public trust in the integrity and quality of scientific publications that has been established over hundreds of years. The subscription model, in which the users pay (and institutions like libraries that serve them), ensures high quality, independent peer review and prevents commercial interests from influencing decisions to publish. This critical control measure would be removed in a system where the author—or indeed his/her sponsoring institution—pays.



Because the number of articles published will drive revenues, Open Access publishers will continually be under pressure to increase output, potentially at the expense of quality. (Elsevier, 2004)

Additional claims have been made that OA publishing models that rely on author-supported fees place inappropriate incentives on publishers. As higher levels of revenue would be attainable with the publication of greater numbers of articles, critics contend that the APC models incentivize volume over the quality of published research (McCabe & Snyder, 2013). These concerns have been particularly magnified by the rise of deceptive publishing practices by a small minority of new entrants to the publishing market who have exploited funder mandates and author interest to support OA. These so called “predatory OA” publishers identified a market opportunity and launched a number of journals that are characterized by, “a low acceptance threshold, with a false front or non-existent peer-review process” (Haug, 2013). The proliferation of predatory publishing practices has caused an unfortunate conflation of OA with deceptive publishing practices (Tennant, et al., 2016). These issues were magnified in a now notorious sting operation by John Bohannon, published in the journal *Science*, called “Who’s Afraid of Peer Review,” in which the author submitted a bogus paper on a cancer experiment to a number of OA journals: 60% of those targeted—150 journals—agreed to publish the work (Bohannon, 2013). Highly controversial, not only for its findings but also for ethical concerns regarding Bohannon’s approach, the high visibility of the paper certainly damaged the credibility of the OA movement.

A study by Jeon and Rochet, “The pricing of academic journals: A two-sided market perspective” demonstrated the potentially divergent approaches publishers with varying organizational imperatives might have relating to OA. if the publisher’s objective is to advance

social benefit, they are likely to consider OA models to be beneficial; but profit-maximizing publishers would be incentivized to deliver OA at levels of quality that are socially inefficient (Jeon & Rochet, 2010).

In recent years, the concerns relating to the quality of OA journals have been mitigated through measures to identify and prevent publishing in predatory journals, the rise of a number of high-quality OA publishing outlets, and the successful transition of high quality journals. The scientific community has come to understand and expect that the quality assurance standards of OA journals should, and indeed do, match those of subscription-supported journals (Rohrich & Sullivan, 2013).

It is also worth noting that much of the criticism of OA publishing relating to perverse incentives influencing the quality of research, including the emergence of predatory publishing, stems from the conflation of OA with the APC model. The pervasiveness of this conflation has led to many stakeholders: publishers, librarians, and authors, being unable to disassociate OA as a feature of the output of published research from one of the business models to achieve that outcome. As described by Suber (2016):

[M]any stakeholders believe that there's only one business model for OA journals, namely, charging APCs. This assumption has never been true and has never even been close... The false assumption that all OA journals charge APCs stultifies the debate by limiting discussion to the one best-known option. It also stultifies the deliberations of publishers who believe, perhaps correctly, that the best-known option won't work for them, and therefore conclude, prematurely, that no model will work for them. (Suber, 2016)

This thesis speaks to this issue by highlighting the diversity of OA business models (described in detail in Appendix A), but also by presenting an alternative approach for consideration by study participants that avoids many of the pitfalls of APC based, and other OA transitional models.

## 2.5. Situational Assessments on OA

Studies on the progress of OA demonstrate how it has moved from a fringe activist movement to a formidable force in scholarly publishing (Björk, 2017; Suber, 2009). Within the world of scholarly publishing, OA publishing models have become so popular that even traditional commercial players have made them integral to their future strategies (Anderson, 2013; Björk, 2012; Björk & Solomon, 2014; Suber, 2012). Researchers, funders, and universities alike are making OA central to their policies on research dissemination and library budget allocations. There is increased momentum for open science more broadly, encompassing OA publishing, open data policies, and open research practices.

Despite the reported progress of OA, the scholarly publishing industry bears the legacy of the large commercial publishing houses' run of acquisitions over the latter half of the 20th century. Collectively, they currently publish 53% of all scientific papers in the natural and medical sciences, up from just 20% in 1973 (Larivière et al., 2015). Their grip is even tighter the social sciences, where the top five commercial publishing houses publish 70% of all papers. This oligopolistic control has made these publishing houses more profitable than ever—commanding margins of nearly 40%. Commercial publishing houses have made definitive strides into OA publishing: creating new revenue streams from collecting APCs (Björk, 2013), as well as acquiring OA subject repositories such as the Social Science Research Network (SSRN) and bepress (Schonfeld, 2017).

Studies by Archambault et al. (2015), Björk (2003, 2013, 2017), and more recently Piwowar et al. (2016) have taken quantitative, automated approaches toward measuring the progress of OA. In addition to tracking the DOIs of articles that are made available through self- and institutional OA archiving mechanisms of Green OA and APC-based mechanisms for publishing in Gold OA journals, these studies have also tracked the progress of hybrid OA, where commercial publishers have co-opted an OA model to increase their profitability (distinctions between these business models is provided in the supplementary review of OA research, available in Appendix A).

The earliest surveys of OA and its associated business models have been conducted at the Hanken School of Economics, by Bo-Christer Björk. His first situational analysis, entitled “Open Access to Scientific Publications—an analysis of barriers to change,” was conducted early in the OA movement and described the major obstacles constraining the development of OA publishing (Björk, 2004). Björk returned to the subject a decade later, with his study “Open Access—Are the Barriers to Change Receding?,” in which he revisited his earlier framework to identify whether any of the identified obstacles to OA publishing had shifted or if new barriers had emerged (Björk, 2013). In 2014, a team from Science-Metrix in Montreal provided the largest assessment of the proportion and impact of OA to date in a report developed for the European Commission. They analyzed a sample over one million records published between 2008-2013, and utilized automated web-scraping to identify different types of OA across a number of scientific fields, finding that more than 50% of the articles were freely available online (Archambault et al., 2014). A 2018 study by Piwowar and others used the oaDOI service to conduct a readily reproducible assessment of the prevalence of different forms of OA. Across three samples consisting of 100,000 articles each, they found around 28% of scholarly literature

(estimated in total to be around 19 million articles) was OA and was growing, driven by the increased adoption of APC-based OA models; and that the most recent complete year's content (i.e. 2015) was 45% OA (Piwowar, et al. 2018). These works have provided the body of research on OA publishing with critical benchmark data. This thesis complements the work of these scholars—not by analyzing the barriers identified in their framework toward OA in general, or gaining quantitative data on the growth and progress of OA publishing—but by achieving a qualitative assessment of the respective positions of key scholarly publishing stakeholders at this critical juncture.

## 2.6. Towards richer understanding

The always unsteady balance of communal and commercial interests in scholarly publishing appear to be at a historic juncture. On the one hand, those interests have tipped dramatically in favor of the capitalist values of commercial publishing houses, and on the other hand, they appear to be moving fully toward the communal values of OA. Certainly, OA initiatives have in recent years regained some of the balance in reestablishing the values of the knowledge commons, yet some OA initiatives have seen encroachment by commercial publishers. We have reached a point of some complexity in sorting out the values and determining the path forward for scholarly publishing. Relationships between publishers and librarians are under intense strain, as evidenced by the increasingly long, complicated, and contentious negotiations underway between library consortia and academic publishers. The question remains of how to navigate this impasse between the communal objectives of academia and libraries that have brought OA to the tipping point and the commercial values of publishers, the largest of which potentially see little financial incentive to transform their underlying business models beyond the status quo.

To gain a richer understanding of the situation facing scholarly communication—beyond the quantitative data—and to help these parties move forward in this historic balance of interests, there exists a need for a much stronger awareness and assessment of the beliefs and understandings of the major stakeholders concerning the shape and nature of a balance that would best serve research and scholarship for the digital era.

## **Chapter 3: Methodology**

### **3.1. Methodology Rationale**

This thesis addresses the identified need for a qualitative assessment of the major stakeholder's response to the current state of OA through a mixed-methods approach. The aim of this work is to gain an appreciation of the respective positions, understandings, and beliefs of the two major stakeholders in scholarly publishing—academic librarians and publishers—with regard to the rise of OA and its implications for the future of scholarly publishing. Accordingly, the research questions in this thesis uncover points of convergence and divergence in positions between the stakeholder groups, and describe what these positions and points reveal about the current nature of the knowledge commons, both in a historical sense and with regard to the digital paradigm shift. To achieve this goal, I present the publishers and librarians with a specific, concrete instance of a commons model designed to move scholarly publishing beyond its current reliance on library subscriptions to journals, using a “Subscription-Equivalent Transition”.

### **3.2. The Subscription-Equivalent Transition**

The Subscription Equivalent Transition (SET), first conceptualized by Willinsky as part of the OA Publishing Cooperative Study in 2015, is intended to serve as a starting point for engagement between librarians and publishers for transitioning from a subscription-based publishing model to an OA model. The SET is premised on the notion that the academic community has a growing interest in OA as an alternative to subscriptions. It is proposed specifically as an alternative to APC-based approaches, which have only proven to advance OA in well-funded disciplines (Armbruster, 2005; Björk, 2017) and well-resourced institutions who have, in many cases, required greater institutional investments for supporting APC payments

over and beyond expenditures on journal subscriptions (Björk, 2012; Pinfield & Middleton, 2012); potentially damage the scholarly enterprise by incentivizing volume of publication over quality (Bohannon, 2016); and serve to further marginalize research communities where budgets may not be available to support the payments of author fees (Feess & Scheufen, 2016).

Increasing examples of cooperation between libraries and publishers (such as the SCOAP<sup>3</sup> initiative, Knowledge Unlatched, the Open Library of Humanities), suggest that there is the potential for cooperation between stakeholders to advance OA. These forms of cooperative arrangements can operate through the redirection and reallocation of resources, rather than requiring additional funding: a feature that is likely a necessary condition, particularly as the research has demonstrated that academic institutions, in advancing OA, are seeking “zero-change in annual net costs” (Jubb, 2011). However, given the complex set of business arrangements that would need to be worked out between stakeholders to establish a sustainable model, a financially secure transition period is likely a necessary condition to alleviate potential risks. The SET strategy therefore leverages the existing subscription economy operating between libraries and journal publishers/vendors, premised on the idea that a journal’s existing subscription revenue is the best predictor of its initial OA publishing costs. The SET strategy enables libraries to enter into an arrangement in which they continue to support the journal at levels equivalent to those agreed upon under their subscription arrangements (and are thus expenditure neutral), and for journals/vendors to receive a stable three-year financial allocation to support publishing journals OA, as well as entering into cooperative deliberations between libraries on future modes of organization, structure, and financing of sustainable OA models.

The SET was formulated as a model for consideration, embodying minimal change from the prevailing subscription based model—leveraging its existing economics, mechanisms, and



established transactional relationships—to alter the primary outcome of the process, i.e., for the supported content to be published through a service model with an OA license (as opposed to purchasing access to licensed content through a subscription model). The purpose for formulating this model, aside from demonstrating the potential value of this kind of approach, was to identify points of agreement and disagreement held by both sets of stakeholders at this key juncture in the history of scholarly publishing. In this way, the model was designed to serve as a form of a *Rorschach* test, enabling representatives to respond to the model to reveal their positions on OA, to raise issues of concern relating to OA, and to identify points of divergence and convergence between the two stakeholder groups.

### 3.3. Cooperative models

For the purpose of this thesis, a broad definition of cooperative models was applied, i.e. in which the two major stakeholders, namely research libraries and publishers (including scholarly societies, university presses and commercial publishers), work together toward achieving openness, efficiency, and quality in scholarly communication. Mutual cooperation in these models is based on the shared recognition of the value, resources, and expertise each party brings to the cooperative arrangement (Ostrom, 1990). The specific structure, size, and coordination mechanism of cooperative models are potentially variable, and subject to determination through negotiations in each instance of cooperation, but the underlying principles of these arrangements remain consistent across all forms.

### 3.4. The SET Cooperative Scenario

To provide study participants with an instance of a cooperative model between libraries and publishers and a practical transition mechanism towards this model, a scenario was devised to

librarians and publisher representatives to weigh the advantages, disadvantages, controversies, opportunities related to the scenario. The scenario sets the context for the SET cooperative survey and the publisher consultations.

The surveys and consultations were designed to collect responses from these stakeholder groups on key elements of three main components of this scenario: the SET strategy, the establishment of a cooperative model, and the post-SET model. The SET Cooperative Scenario is described as follows:

- It may be that a group of subscription journals, perhaps in conjunction with a set of OA journals, decides to form a cooperative OA model; alternatively, a group of libraries decides to reach out to a set of subscription and OA journals, inviting them to form such an arrangement. It could begin with a single title, a big-deal journal bundle, or anything in between.
- The journals then invite their subscribing libraries to consider the cooperative arrangement as an alternative to subscription renewal under the same financial terms (assured for three years), the libraries can convert the journals to immediate OA by joining with them in the cooperative model. Time would be needed to negotiate the agreement of all subscribing libraries, which is required in principle.
- Existing OA journals may be part of the initial group of journals or be invited to join the co-op during the SET period, on the condition that such journals will continue their current open access model of support involving grants, libraries, institutions, APCs, and other sources.
- If and when an agreement is reached to form a cooperative funding model among the libraries and journals, the two stakeholder groups would establish the mechanisms for sustainability (including management, finances, and participation). They would engage

meaningfully and transparently on issues relating to publishing, curation and management costs.

- The data collected during the SET period would be used to develop, test, and refine a cooperative economic model for OA, with revenue based primarily on transitioned library payments, as well as other existing sources of support (e.g. agency funding, innovation grants, institutional support and other sources) to cover expenses including, but not limited to, publishing costs, systems support, innovation, and management.
- The goal is to arrive at a common, cost-effective publishing model by the end of the third year that contributes to improvements in scholarly publishing that are shared with all—with the outcome of the model resulting in sustainable OA publishing of valued journal content. The SET period would conclude with a decision to proceed under a cooperative funding arrangement or to revert back to the subscription model.

### 3.5. The SET Cooperative Survey

To assess the perceptions of librarians and publishers to converting subscription journals to OA through the SET strategy, two online surveys were developed (using the Stanford University Qualtrics Platform) to be completed by both stakeholder groups. After some short demographic questions to identify participants by Title, Institution/Publisher, and Country (and assurances to preserve anonymity in reporting of results), participants were directed to a 10-question survey. The survey questions were categorized by the three main components of the strategy—i.e., the SET, establishing the cooperative OA publishing arrangement, and the post-SET model. The survey questions were designed to determine the potential advantages and principal challenges

and risks to such a model for each stakeholder group in relation to existing and alternative means and methods, as well as overall views on the implementation/viability of each component. Multiple choice questions were populated with five pre-identified options each, with each question/option utilizing a seven-point likert (agree/disagree) scale. Comment boxes were included with each question/option for survey participants to further elaborate on their responses.

Two parallel surveys were developed, one customized to provide for the interests/concerns of librarians, and the other for publishers; both surveys followed the same question format and logical structure to allow for comparison in responses from the different stakeholder communities. The surveys for both libraries and publishers were piloted with small groups (of 19 and 5 respectively) from each stakeholder community, and the questions/structure of the survey was revised to address any issues/concerns prior to administering the survey. The surveys are available at Appendix B.

#### 3.5.1. Survey Sample

The Librarian Survey launched online in May 2016, and the Publisher Survey launched shortly after in July 2016. Participation in the surveys was solicited from online listservs, popularly used by stakeholders in the scholarly publishing community: the Association of College and Research Libraries' *Scholcomm* listserv, the Center for Research Libraries' *Liblicense* listserv, and the listserv of the Open Scholarship Initiative. Two rounds of recruitment were conducted for each survey.

##### 3.5.1.1. Librarian Sample

A total of 188 librarians (104 female and 84 male) representing 132 institutions from 29 countries completed the SET Cooperative Librarian Survey. The tables below demonstrate the

breakdown of respondents by country/region (Table 3.1) as well as title/role (Table 3.2). Of these 188 librarians, the majority—ranging from 92% to 100%—answered each of the 10 survey questions, with the lowest response rate (for Question 8.A. and 10.A.) of 164 (87%). Of the 188 respondents, 164 completed the entire survey (survey completion rate 87%) which is particularly notable due to the length of time respondents took to complete the survey: on average 42 minutes. To preserve the anonymity of responding librarians, each was assigned an alpha-numeric code (e.g. LBR001).

| Region                | Country              | Participants | Total By Region |
|-----------------------|----------------------|--------------|-----------------|
| North America         | Canada               | 42           | 124             |
|                       | United States        | 82           |                 |
| Europe                | Austria              | 4            | 32              |
|                       | Belgium              | 4            |                 |
|                       | Bosnia & Herzegovina | 1            |                 |
|                       | Croatia              | 1            |                 |
|                       | Denmark              | 3            |                 |
|                       | Ireland              | 1            |                 |
|                       | Netherlands          | 2            |                 |
|                       | Spain                | 8            |                 |
|                       | Sweden               | 2            |                 |
|                       | United Kingdom       | 6            |                 |
| Central/South America | Brazil               | 2            | 8               |
|                       | Chile                | 1            |                 |
|                       | Mexico               | 3            |                 |
|                       | Uruguay              | 1            |                 |
|                       | Venezuela            | 1            |                 |
| Asia/Australasia      | Australia            | 5            | 10              |
|                       | China                | 1            |                 |
|                       | Pakistan             | 1            |                 |
|                       | Turkey               | 1            |                 |
|                       | United Arab Emirates | 2            |                 |
| Africa                | Cameroon             | 1            | 14              |
|                       | Ghana                | 1            |                 |
|                       | South Africa         | 8            |                 |
|                       | Tunisia              | 1            |                 |
|                       | Uganda               | 1            |                 |
|                       | Zambia               | 2            |                 |
|                       | Zimbabwe             | 2            |                 |

Table 3.1. SET Cooperative Librarian Survey Respondents by Region/Country

| Title   | Respondents |
|---|-------------|
| Library Director/Dean/Associate Director                | 52          |
| Scholarly Communication / Digital Initiatives Librarian | 63          |
| Collection Development/Acquisitions Librarian           | 12          |
| Electronic Resources Librarian                          | 11          |
| Subject Librarian                                       | 14          |
| Copyright Librarian                                     | 11          |
| Librarian (General)                                     | 55          |
| Academic Services Librarian                             | 8           |
| Open Access Librarian / Coordinator                     | 5           |
| Library Science Academic Staff                          | 14          |
| Head of Research  | 8           |
| Other   | 24          |

Table 3.2. SET Cooperative Librarian Survey Respondents by Title/Role

#### 3.5.1.2. Publisher Survey

The Publisher Survey yielded a low response rate, with 29 publishing company representatives initiating the survey, but only 14 completing; a completion rate below 48%. Due to this low rate of participation, an alternative strategy of publisher consultations was implemented through direct consultations/interviews with representatives of 20 scholarly publishers.

### 3.6. Publisher Consultations

Given the concentration of a few large publishers controlling the market of academic publishing (as described by Larivière, et al., 2015), the method of direct consultations was selected as a more efficient mechanism to gain a representative sample of publisher perspectives.

Furthermore, given the stratification of the publishing market as highlighted by Willinsky (2009) into independent journals, scholarly societies and commercial publishers, a consultative process was designed to systematically interview representatives from each segment of scholarly publishing. Designed to follow the a similar logical structure as the SET Cooperative survey, these interviews allowed for the responses of the publisher participant group to be segmented based on their specific organizational imperatives. To allow for frank and open discussion, publisher responses were anonymized for individual as well as parent company. For the purposes of this study, publisher responses were divided into two broad categories: commercial (i.e., for-profit) publishers, and nonprofit (i.e., scientific society, scholarly association, and independent) publishers. These categorizations informed the analysis of the interview data, to identify issues and concerns raised relating to the model and the key distinctions between these two groups of publishers, as well as their respective points of alignment or divergence with the views of academic librarians.

#### 3.6.1. Publisher Consultation Sample

For the publisher consultations, a sampling scheme was devised that captured a broad range of perspectives based on the stratification of the publisher market. For each of the publishing companies, I identified and interviewed the main representatives working on OA and strategic issues for their respective companies. To preserve the anonymity of publishers, a coding scheme



was devised to identify publishers by the specific segment of the industry they represented (Table 3.3.).

| Publisher Type                              | Respondents | Code | Journals Represented |
|---|-------------|------|----------------------|
| Commercial Publisher                        | 6           | CMPR | 12,320               |
| Nonprofit Publishers:                       | 14          |      |                      |
| Society Publishers (self published)         | 9           | NPSP | 235                  |
| Society Publishers (commercially published) | 1           | NPCP | 20                   |
| Professional Association Publishers         | 2           | NPPA | 114                  |
| University Presses                          | 1           | NPUP | 380                  |
| Independent Nonprofit                       | 1           | NPIN | 51                   |

Table 3.3. Participants from among academic publishers (n= 20).

Consultations were conducted with representatives from 20 scholarly publishers (11 female, 9 male): including 6 commercial publishers, 10 scientific society publishers, 2 scholarly association publishers, 1 university press, and 1 independent nonprofit publisher. It is worth noting that of the 10 society publishers included in this study, only one had outsourced its publishing to a commercial publisher—the remainder retained autonomy over their publishing operations.

The sampled publishers collectively publish a total of approximately 13,567 journals, covering over 40% of the total number of English-language journals in the world indexed in Ulrich’s Global Serials Directory. In terms of market share, the publishers included in the sample cover between 50-60% of the total market in STM disciplines, and more than 70% of the market in social sciences (applying estimates from Larivière et al., 2016).

### 3.7. Data Analysis

The SET Cooperative Scenario was formulated to evaluate libraries' and publishers' positions on cooperative models of OA that could work across the disciplines (which is to say, without APCs for authors). To provide a viable starting point to achieve this goal, the SET Scenario was designed to be a revenue-neutral model for publishers and an expenditure-neutral model for libraries, that would result in a transition of subscription-based scholarly journals to OA. The underlying assumption was that any model that financially disadvantaged either of these stakeholders would likely be dismissed without further consideration. For publishers, the model would increase the likelihood of further consideration if they could be assured that the revenue achieved through the prevailing subscription model could be maintained. Academic libraries on the other hand, would have an interest in continuing to sustain access to journals to support the needs of scholars at their institutions at current levels of expenditure, and further increase the impact of their collections by using their budgets to support the transition of content to OA. They would be supporting a service rather than purchasing content. Entering into the SET would require both sets of stakeholders to demonstrate their willingness to advance OA through an alternative business model

The Librarian Survey data was analyzed to determine points of agreement/disagreement with specific aspects of an instance of the knowledge commons in operation in scholarly publishing. More specifically, the analysis focused on aspects of the SET Strategy. The likert survey data was analyzed to reveal the extent to which librarians agreed or disagreed with specific aspects of the advantages, challenges and risks to cooperative models, as well as to gauge their overall views on implementation/viability the model.

The publisher consultations were transcribed and coded thematically to surface frequently recurring themes across the dataset, as interviewees responded to the SET cooperative model and its viability, underlying principles, mechanisms, and implications to their specific publishing model (discipline, content types, etc.). Given their fundamental difference in mission, responses from commercial and nonprofit publishers were disaggregated; however, alignment between these two groups on key issues is highlighted in the results/discussion chapter.

Following the analysis of each dataset independently, the data gathered from the survey of librarians and the interview responses from scholarly publishers were analyzed independently to identify common emerging themes. To reflect the varying degrees to which libraries and publishers expressed their postures toward OA, responses from both sets of stakeholders were coded thematically. Analysis of the coalescing of opinions among the librarians and publishers suggested a spectrum of positions that could capture the overlap and divergence both between and within these two stakeholder groups. The scale represents the degree to which a response reflects a stakeholder's respective position on OA's place in scholarly publishing (represented in Figure 3.1.): at one end, where responses implied that OA is contrary or detrimental to science; and at the opposite end, where OA is considered integral to the progress of science in the digital age.



Figure 3.1. OA's place in scholarly publishing: The response spectrum on the relation of open access to scholarly communication as suggested by the analysis of librarian comments and publisher interviews.

This spectrum enabled the identification of issues that were most critical and frequently cited by both sets of respondents, but also to establish points of convergence and divergence in each stakeholder group's positions on OA.

### 3.8. Value

Scholarly publishing has reached a historic moment with the rise and return of the knowledge commons to an industry that has in recent years been under the control of commercial forces and has led to oligopolistic market conditions. In this climate, the relationships between librarians and publishers have been increasingly strained, leading to an impasse on the road to a more open and efficient scholarly communication in which OA is the default mode of research communication. Numerous studies have charted the rise of OA, and recent studies have provided quantitative assessments of the growth and increased presence of OA, yet these quantitative studies have been mostly speculative on the responses, approaches, values, and beliefs of major stakeholders. This study complements previous studies by Archambault et al. (2015), Björk (2003, 2013, 2017), and Piwowar et al. (2017) and provides a clearer picture of the specific positions between the two stakeholder groups in response to OA, including the points of agreement (convergence) and the points of disagreement (divergence) between librarians and publishers.

The goal of this research is to identify the key issues for the future of scholarly communication raised by the responses to the opportunities and challenges posed by OA. It is to foster a greater understanding of the values and goals that connect and separate the two principal stakeholders in scholarly communication in hopes of supporting more informed and productive

engagement in the transition of scholarship away from subscriptions toward OA, now that there is widespread recognition that this is what is best for advancing research and scholarship.

### 3.9. Limitations

The sampling method for the survey—soliciting participation through the Scholcomm, LibLicense, and OSI listservs—did not yield results that fully captured the diversity and global nature of scholarly communication. Given the predominantly Western (primarily North American) audience and user-base of these listservs, responses from these communities significantly outnumber responses from higher education and research communities in Europe, as well as other parts of the world. The sample does reflect (to an extent) the funding situation within research and scholarly publishing (the majority of financial resources spent on academic journals are from institutions in the United States and Europe), but a more representative sample would have sought greater global representation, particularly from Asia (and most notably from China). Similarly, the sample for publisher interviews—designed to represent the interests of many of the most prominent publishing houses in scholarly publishing—provides a limited view of scholarly publishing.

The use of a practical instance of the knowledge commons with the SET-Cooperative approach places further limitations on the study. Although this model was devised to be realistic in its commercial aspects (being subscription-equivalent) as a way of soliciting concrete responses to a commons-based business model, in the survey data it restricts the responses to considerations around the specifics and novelty of this model, as opposed to other communal activities that might have been undertaken by participants. This limitation is addressed in part in the publisher consultations, where participants were asked more general questions around other OA activities and approaches.



## **Chapter 4: Results and Discussion**

### **4.1. Analysis of Convergence & Divergence**

In this chapter, I present an analysis of the librarian's and publisher's responses to uncover, identify, and organize the dominant themes that emerged from the data. Using the OA response spectrum (described in Chapter 3) as a guide, I highlight specific points of agreement between the two stakeholder groups, research librarians and scholarly publishers, represented by the convergence of their responses on points on the OA spectrum. I also discuss points where there is no such common understanding, represented by divergence on the spectrum or the relative absence of a coherent position by one group compared with a strongly held viewpoint by the other. This is intended to illuminate the values, positions, and concerns of both stakeholder groups to help facilitate improved understanding of the forces at work at this historic juncture in scholarly communication. This type of systematic analysis of points of convergence and divergence may lead to improved communication between libraries and publishers in progressing toward universal OA.

#### **4.1.1. Overall Commitment to Open Access**

The notion that OA has become integral to the progress of science with the emergence of the digital era was a particular point of convergence between librarians and publishers. It reflects the widespread recognition across both sets of stakeholders that OA is more conducive to the progress of science than the closed subscription model that so suited the world of print, although this convergence was clearest between the libraries and nonprofit publishers.

The group of surveyed librarians unequivocally expressed a commitment to OA through their responses to the likert-style questions in the SET Cooperative survey, as well as the open-ended responses to survey questions, situating them firmly into the response spectrum as believing that OA is integral to scholarly publishing. This was demonstrated powerfully in their response to Question 10 of the survey, in which respondents were asked to indicate their willingness for the library to pursue the SET and cooperative OA models as strategies for expanding and sustaining open access (Fig. 4.1). Of the responding libraries, 89% (n=164) indicated their agreement; with fewer than 4.9% expressing disagreement (and none strongly disagreeing against pursuing the model).

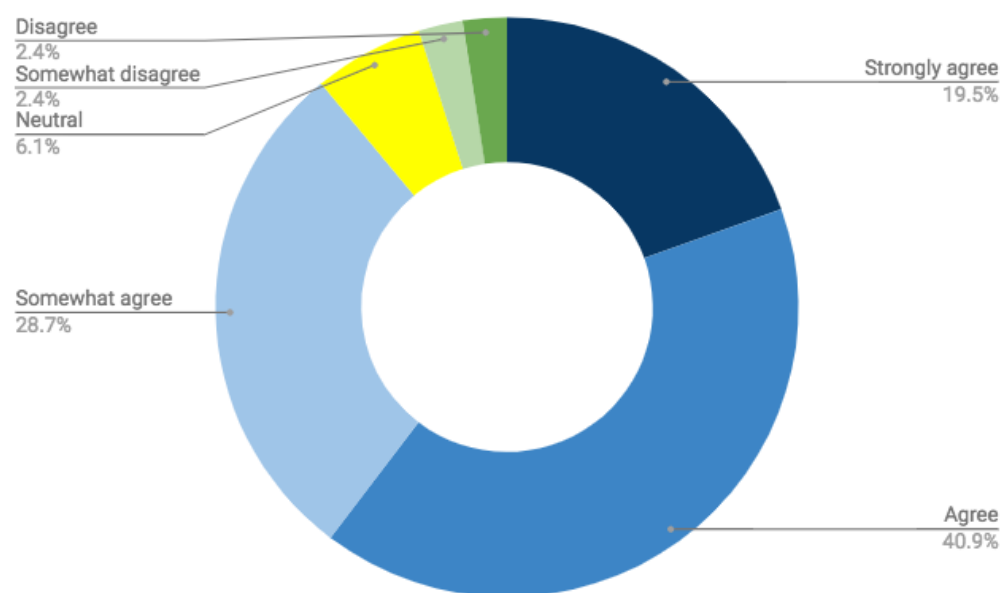


Figure 4.1. Prompt: Overall, I would recommend that my library further explore both the SET and cooperative strategies for expanding and sustaining open access to research and scholarship (n = 164).

This demonstration of librarian's collective stance on OA was also reflected in Question 1 of the survey, where they were asked to reflect on the promise of the SET model for converting subscription journals to OA (Fig. 4.2).



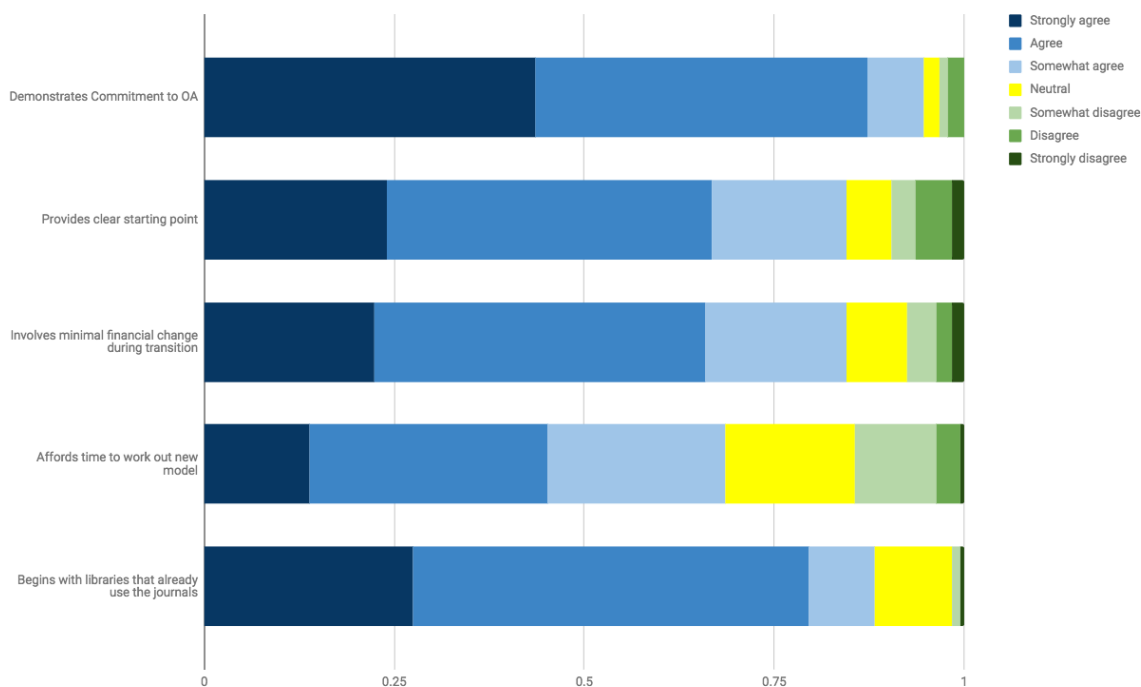


Figure 4.2. Response to Survey Q 1: The following reasons describe why the SET is a promising strategy for converting subscription journals to open access and initiating cooperative publishing (n = 184).

The response of the librarians to this multipart question was overall positively weighted toward the SET as being a viable strategy. Of the five subquestions, the most dominant response—with 94.7% of respondent librarians in some degree of agreement—was that the model “Demonstrates a Commitment to OA,” a strong expression of the alignment of this model with the values of librarians.

The librarians’ belief in OA being integral to scholarly publishing was further reinforced through the open-ended responses to survey questions. This was reflected by a librarian who claimed that the SET model would “allow libraries to better achieve their mission of knowledge

sharing”(LBR159). While invoking the “second law of library science,”<sup>2</sup> a librarian asserted that “providing access to information is a core value of the library. I know this makes me an idealist, and a rather handicapped one because I have to deal with the reality of budgets etc. But for me, offering me a way to adhere to this principle within the boundaries of reality is the biggest benefit”(LBR015).

In advising how best to secure the success of OA projects, a librarian recommended an appeal to these core values, and suggested that the alignment of transition models with these values would garner the continued support of the library community:

Beyond just explaining the practical aspects of the transition, I think it would be useful to make an appeal to values, and how this approach is much better aligned with the mission and values of libraries and their host institutions than the current dominant model is.

Money is fungible, but values are not. Institutions can choose to spend or cut in different areas as priorities change, and this can be dangerous to the stability of any funding model that doesn't have vendor lock-in, but if they clearly believe that something is strongly aligned with their values and mission, libraries and universities will find ways to ensure that it continues and is adequately funded. (LBR159)

Similarly, a number of librarians suggested that the proposed OA transition model would reflect the libraries’ values in supporting scientific progress, for example, “You have a strong case philosophically that librarians will want to support. I do want research output to be accessible to lesser developed areas, the independent researcher, the faculty member at a smaller institution

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<sup>2</sup> Proposed by S. R. Ranganathan, the “Five Laws of Library Science” define a set of norms, precepts, and guides to practice in operating a library system, and are accepted by many librarians worldwide as foundations of their philosophy. The second law of library science, Every Reader His or Her Book, is about library collections meeting the needs of the community of users (Ranganathan, 1924)

with less support. I think a research environment that is more open will be more innovative” (LBR122). It was a common position to support OA as a public good: “Taking responsibility for our values — e.g., access is something we value, but we limit access so narrowly when we sign licenses. Not just involvement in the process, but the capacity to change the process to deliver a public good” (LBR144).

The powerful endorsement of the SET model by librarians on the basis of the alignment of OA with the collective values of this community is reinforced by the historical position of libraries (described in Chapter 1) dating back to the monastic period, where scribed writings were freely copied and distributed among monasteries, and in the seventeenth century by the insistence of patrons such as Thomas Bodley who ensured that the library he restored at Oxford University be open to the public. Which is to say that such institutional libraries have long represented a knowledge commons. Despite the commodification of knowledge and the increased commercial enclosure of much of scholarly communications over the past half-century, librarians have upheld these values, which are now enshrined in professional codes of practice and ethics, and are recognized across the global community of library professionals. The Code of Ethics of the International Federation of Library Associations (IFLA) explicitly states that the right of access to information “includes support for the principles of open access, open support and open licenses” (IFLA, 2019). As key custodians of the knowledge commons, libraries are now able to go beyond the monastic chest or the university library of print and foster a future for scholarship that is empowered by digital technologies and further opens up the communities served, establishing the kinds of thriving intellectual commons envisioned by scholars such as Elinor Ostrom and Charlotte Hess (2003). The results of this survey and the history of academic libraries reinforces the overall strong alignment of the values of the library community with OA

to scholarship, and demonstrates their willingness to organize the forms of arrangements and institutions advanced by Ostrom to transform the scholarly communication enterprise for the good of science.

What is striking is that many of the 20 interviewed publishers shared the position that OA is integral to science. This was most clearly the case (albeit not exclusively) in the responses of nonprofit publishers (society publishers, independent nonprofit publishers, and university presses). Among the 14 interviewed nonprofit publishers, the majority stated their strong support for OA as being not only “for the good of science” (NPSP04), but also in advancing their organizational mission. As stated by one nonprofit publisher representative:

We represent scientists across the range of science...and part of that is maximizing the benefit of research. And maximizing the benefit of research is probably best realized by open access. We don't feel that it is appropriate that research is treated as a salable commodity, because we consider it a public good and so our mission inevitably leads to a pressure to move to open access. (NPSP04)

Another nonprofit publisher acknowledged the OA movement and its alignment with the organization's mission as motivating their transition to OA:

There is both a push and a pull. The push is the OA movement itself. As an organization that is run for researchers and by researchers, we are very aware of the support for removing barriers to access for all science publications, and we want to participate. It is a fit with our mission to contribute to the progress of science. The pull comes from the other component of our mission, benefiting society. A functional democracy requires that citizens have access to the knowledge and wisdom of the world's leading researchers. Our authors address many of the issues that society is grappling with today—climate

change, aging, mental health, food and water security, crime and justice, and so on.

Making our journals freely available would be a powerful public benefit. (NPIN01)

The underlying notion of academic knowledge being a public good was emphasized by a university press representative: “[P]ersonally I believe that publishing is a part of research, and there are ethical and moral arguments to supporting open access” (NPUP1). This publisher’s position was also reflected at the organizational policy level: “I think the press has a strong commitment to open research, the open research agenda. That is particularly visible at the moment but we are very much undergoing a strategic review that will include a lot more public surfacing of that. We are solidly behind open research” (NPUP1).

These clear articulations of the positions of nonprofit publishers represented a vital point of convergence with academic librarians. It was perhaps most clearly rooted in the values driving the society or nonprofit organizational mission. Society publishers have been central to academic journal publishing, ever since the launch of *Philosophical Transactions* in association with the Royal Society of London for Improving Natural Knowledge more than 350 years ago, as discussed in Chapter 1. The commodification of academic knowledge by commercial publishers following the post-WW2 period, which was driven by increased national investments in research and the consequent growth of the research enterprise, enabled many nonprofit publishers (particularly societies whose journals were to be carried by larger corporate publishers), to go from generating revenue that supported journal publishing, to generating significant surpluses which have become a financial mainstay of their organizations. While these nonprofit publishers have not strayed far from their core mission to serve scholarship within their respective remits, their embrace of the commodification of research does reflect the dependency on money that takes hold on an organization once it became available. Yet, as the results of this study

demonstrate, nonprofit publishers remain strongly aligned with libraries in their embrace of OA's value, with many recognizing it as being fundamentally mission-aligned.

The embrace of OA as being integral to the progress of science was not a position held exclusively by the nonprofit sector: two of the six commercial publishers interviewed made strong statements in favor of the transition to OA in what was potentially a recognition of the perceived inexorability of the transition to OA, although no specific organizational policy or mission imperative was cited in these remarks. As stated by one commercial publishing representative: "We really would like to be an open access publisher in the end, because we think it makes much more sense to have that stuff available. Also morally it might even be better, but of course we also want to keep living" (CMPR05). The support for OA is present, but there is still the hint here that OA poses a threat to "living," which very much exemplifies a regard for OA as a liability. The other commercial publisher representative who expressed his support for OA was quick to distinguish his personal view from that of his organization: "So I'm a firm believer in the push towards the open access model. My point is that I can't actually profess to talk for [publisher name] in its entirety, because I have a very different spin on these things," and continued: "Let's not fight it. Let's not see it as a threat. Let's embrace it as an opportunity... Let's see if we can figure out a way, with the commercial reality underpinning it" (CMPR04).

With the exception of these two statements, the other three commercial publishers made no declarative statements of their support for OA. On the contrary, the analysis of their responses largely occupied the opposite end of the OA spectrum: They believed that OA posed a liability for academic publishing, or it was, at best, extrinsic to their role in the scholarly publishing landscape. For this group of publishers the subscription model has remained highly lucrative, even through the digital transformation of scholarship in the late 1990s, with this financial

success leading to increased acquisition and control over scholarly communications. There are distinctions to be made among the biggest publishers, as described by a commercial publisher representative: “Even if you look at the top four, they’re all very different companies, with different philosophies: one is a PLC, one is VC driven, one is a family-owned business, and one is basically a healthcare company.” Yet they all share, he pointed out, a common objective as “commercial organization(s) working within a capitalist system” (CMPR04).

It is worth considering these grounds for opposing OA by turning to the rich and partially shared histories of the Open Source Software (OSS) and OA movements (Willinsky, 2005). The OSS community can provide analogous examples of how commercial, for-profit entities can thrive in the delivery of services that add value around intellectual resources that are community owned and governed. *Linux*, one of the most-prominent and widely used operating system softwares is open source, i.e. it can be used, altered, distributed by anyone for commercial or non-commercial purposes. The knowledge commons established around systems such as Linux, maintained by tens of thousands of professional programmers, has been sustained by the differentiation between product and service: although the underlying product is available free, multiple commercial ventures have spawned to provide software services and support (Willinsky, 2005). A notable example of commercial success with OSS is the software company Red Hat, a technology company founded in 1993 that provides enterprise-level software solutions built on the Linux system to deliver professional quality assurance and subscription-based tech support, training, and integration services.

According to Red Hat’s CEO, Robert Young, the key to their business model was in establishing a brand—grounded in a consistently high-quality product—that delivered to their customers the control that they desired over the underlying software, delivered under an open-

source license: “Open-source code is a feature. Control is the benefit. Every company wants control over their software, and the feature of open source is the best way the industry has found so far to achieve that benefit” (Young, 1999). The strength of the brand established by Red Hat made the company remarkably profitable (with net income of US\$ 434 million in 2018) in a software landscape that—similar to scholarly publishing—was once marked by commercial enclosure, and in doing so, fostered a more dynamic and still lucrative technology industry. As described by Young, “Linux and the whole open-source movement represent a revolution in software development that will profoundly improve the computing systems we are building now and in the future” (Young, 1999)

Although there may be certain distinctions between OSS and OA—given the diverse set of practices related to scholarship (Katz et al., 2018)—the example of Red Hat suggests that a thriving intellectual commons and prospering corporate interests are not mutually exclusive categories. If publishers—particularly those with well established brands—were to rethink their business models to transition from content subscriptions to value-added services built around content delivered with open licenses, commercial success is still within reach, while helping foster a more thriving scientific landscape driven by OA to content.

While allowing for the reservations of commercial publishers, which may yet be addressable through such analogous instances as OSS, analysis of the overall position of the two key stakeholder groups demonstrates strong alignment between libraries and nonprofit publishers when it relates to their belief of OA as being integral to scholarship. Both share a belief that OA can contribute to advancing science. The sharing of these common principles suggests the potential for librarians and nonprofit publishers to meaningfully engage through cooperative arrangements to transition content to OA.



The position of commercial publishers remained divergent, largely occupying the opposite end of the OA spectrum. Among this group of publishers, a range of issues was presented regarding subscription-equivalent transitions and OA, largely representing a liability to scholarly publishing. Although concerns around OA as a liability for scholarly research were not the exclusive domain of commercial publishers, the lack of agreement on the fundamental (and now widely accepted across scholarly publishing stakeholders) importance of OA to fostering improved science requires further surfacing of the specific issues raised by this group and the mechanisms to help address them. Given the extent of commercial control over scholarly publishing, the goal of achieving universal OA will likely be unachievable without reconciling the reservations of this group of publishers. For these publishers, other issues, such as publication costs, offering choices of publishing outlets for researchers, growth and revenue generation, the growing volume of research output, etc., were more prevalent (as highlighted in Section 4.2), which reflects the tendency to compound current issues in scholarship that detract from the acknowledgement of OA as being integral to the progress of science in a way that challenges progress on this central issue.

*Conclusions.* Libraries are vital to the maintenance of the knowledge commons, with deep historical roots in scholarship. As a key stakeholder in this system, they collectively represent a network of institutions that are dedicated to supporting education and research, as well as the preservation and cultivation of knowledge. This study demonstrates that the values of libraries strongly align with OA being integral to scholarship. Building on their historical tradition and values, libraries now recognize that OA can extend their reach beyond their walls and further advancing their collective mission. To achieve this goal, librarians are demonstrating their

willingness to go beyond transactional relationships to subscribe to limited access to content and invest in new financial partnerships for publishing services to deliver open scholarship to the world.

The views of librarians on the centrality of OA to the future of scholarship converge powerfully with the mission-driven values of the nonprofit publishing sector. Scholarly society publishers and university presses built the foundations of scholarly communications for the first three centuries of industry, prior to the dramatic incursion of large commercial publishers in the decades following the second World War. The values of scientific societies—to advance science and scholarship in their respective disciplines—have largely been upheld through the digitization of scholarly communications. As described by Lisa Norberg:

Scientific and scholarly societies exist to further the field they represent by facilitating communication between scientists, scholars and their publics and they are often associated with the highest impact and most prestigious journals in their disciplines. By flipping their journals, societies are not only fulfilling their mission but also setting an important example for others to follow. (Norberg, 2016)

University Presses and independent nonprofit publishers — who were similarly pushed towards surplus generating (as opposed to cost-recovery) business practices also recognize the opportunities OA provides in advancing scientific enterprise, and their strong value alignment with libraries suggests that they are ready to engage with libraries to achieve a sustainable transition.

Commercial publishers were overall more reticent to acknowledge OA as being central to the future of science. With two notable exceptions of convergence, this group has largely viewed OA as being a liability, or at best an extrinsic force in the future of scholarly

communications. This stance suggests that libraries and OA advocates need to work with commercial publishers to reconcile their concerns around retaining revenues in the shift from the content-based subscription model to the OA model where they would be paid by libraries collectively for delivering publishing services. By agreeing to the principles behind the SET model, libraries are recognizing the value delivered by publishers, and their willingness to transition from a closed subscription model to a publishing services model based on existing expenditures and budgets.

Models based on revenue neutrality in the move to OA—such as those that ensure economic parity with the subscription model in terms of providing current revenue, agreed annual price increases, etc.—are likely a necessary condition for commercial publishers to even begin to consider the shift in business model. One starting point might be for OA advocates to provide publishers with case studies in which commercial entities have thrived in the delivery of openly licensed content. Applying the example of Red Hat in OSS: just as their quality assurance, customer service, and training model was sold to customers, leveraging the strength of their brand, large commercial publishers may also deliver similar services of value and retain their existing brand strength—or even enhance it with new, innovative services—while transitioning the content they deliver to open licenses. Just as OSS has become the standard in the high-technology industry and fostered dynamic growth, OA has the potential to foster a thriving and more dynamic scholarly communications industry in which openness and commerce are not mutually exclusive.

#### 4.1.2. Library Budgets and Publisher Revenue Neutrality

A central value proposition of the SET model is that it requires minimal change from the existing subscription model, in particular relating to financial aspects. Publishers are not likely not enter

into cooperative arrangements that would result in a net revenue loss, and the research has demonstrated that a “zero-change in annual net costs” is a necessary condition for academic libraries for advancing OA (Jubb, 2011). Relating to this aspect of the model, a telling distinction was revealed between libraries and publishers. While surveyed librarians were responding to the financial neutrality of the SET transition model, publishers were not, and instead were compounding issues prevailing in the existing subscription model that they were bringing to bear on the risks of pursuing new OA models.

For librarians, expenditure neutrality was recognized as a strength of the model, with the majority (84.6%) agreeing with the notion that the model “involves minimal financial change” during the transition, and also that it leveraged existing transactional relationships, with 88.1% supporting the element that the transition “begins with libraries that already use the journals” (demonstrated in Figure 4.2, above). Through this response, librarians reinforced their belief that OA is integral to scholarship in the digital age, and that the SET model provides an opportunity to reach this goal.

This largely positive response from librarians was tempered by the small percentage of librarians who disagreed (7.5%) with the notion that the model provided minimal financial change, and they shared the view that transitional models should offer budgetary relief, rather than being expenditure neutral: “Libraries' budgets need relief—many still continue to have budget cuts—so promising to pay equal or like amounts in fees (instead of subscription fees) doesn't offer relief. If a basic principle was to make the process more efficient financially as well as free to reader and author participants, then these would be stated objectives that might guide the model” (LBR183).

This concern was shared by another librarian who described an expenditure-neutral transition as being “[l]argely too expensive. We don't accept to continue to pay so much money for access to the papers we wrote for free. This is not a solution for scientific community. It's just a wonderful opportunity for publishers to guarantee their revenues” (LBR72). These concerns from librarians seemed particularly pointed at commercial publishers: “There are costs to open access publishing, but those costs will be reduced when the lion's share of a library's budget is not tied up in subscriptions to publications published by the for-profit sector which now dominates scholarly journal publishing” (LBR121). The quote from this librarian exemplifies how some members of the library community—even in their unequivocal overall embrace for OA—compound issues of the commercial dominance of scholarly publishing with opportunities for advancing OA. Although it may certainly hold true that libraries would gain greater budgetary autonomy if their financial resources were not bound in agreements with commercial publishers, it is not clear whether costs would be reduced — although such a reduction was inferred by Bergstrom and Bergstrom (2004). The SCOAP<sup>3</sup> initiative does point toward the potential for cost reduction, with reduced negotiated article production costs secured through fostering a competitive market for publishing services (Kohls & Mele, 2018).

Academic librarians overall demonstrated their willingness to enter into financial arrangements with publishers that retained existing economic structures, and the profits and surpluses associated with them, to achieve the goal of advancing OA. As described by one librarian, however, the acceptance of the SET model would likely depend on the nature of the publisher and its current levels of profitability: “This may be a promising or possible strategy for some journal publishers, who do not rely on or are prepared to do with less; it would appear to be less promising for those that expect/need high revenues or profits. Not all publishers are the latter

group” (LBR183). A librarian further acknowledged their acceptance of current publisher surpluses, elaborating that, “The key benefit, one hopes, would be the ability to foster a more financially sustainable publishing enterprise (financially sustainable for libraries and universities, that is), with the ability to control costs and profits, and to be comfortable with how publishing surpluses are used” (LBR014). As implied in this comment, greater financial transparency and accountability would likely motivate library support in maintaining publisher surpluses or profits.

The accommodation of market forces expressed by librarians in sustaining existing economic arrangements with the goal of advancing OA would not be without precedent; as demonstrated in Chapter 1, the history of scholarship is rife with examples of reconciling commerce with the goal of advancing the intellectual commons. Just as Oxford’s John Fell traded in the privileges granted to his university’s press, securing commercial partnerships with monopolist London presses to subsidize and enable the publishing of learned works, the library community today needs to reconcile with the dominant commercial forces that pervade publishing. This reconciliation, however, needs to be accompanied by the recognition of the vastly different opportunity OA dissemination provides us now that we are not constrained—as scholarship was for centuries—by the limitations of the printed text. OA provides libraries the opportunity not only to provide for the production and distribution of scholarly works for the community but also to transform the very nature of the scholarly enterprise. The results of this work demonstrate that libraries are ready to engage with publishers on this basis.

Across the sampled publishers, revenue concerns were frequently cited, situating them as considering OA as being a liability; although again there were clear distinctions between the nature of the concerns expressed by nonprofit and commercial publishers. One nonprofit

publisher described how their “science policy unit which is separate from publishing, have published a number of reports recently about the need for openness in science, transparency, data sharing...so all that policy work is also in-line with open access. The only kind of barrier to it is not the hearts-and-minds element, it’s the money” (NPSP04).

For society publishers, the publishing of journals was acknowledged as an important vehicle for revenue generation to support society activities, which affects the level of risk they might be willing to take in exploring transitional models. As described by one such publisher:

Keeping the revenue coming is a huge concern. As with most societies, at least in our case 65% of our revenue comes from the publishing program. Even though we’re not-for-profit and we are not expensive, we do generate a surplus which allows us to subsidize a lot of society activities. (NPSP02)

Although the percentage contribution of the publishing divisions of society publishers varies across societies depending on their size and discipline, a study by Johnson and Fosc (2015) found this to be on average 25% of total revenue (across UK learned societies). For society publishers, these revenues have become indispensable to support society activities ranging from organizing meetings and professional forums, public engagement, scholarships, etc. In their evaluation of the value delivered by publisher site licenses, Bergstrom and Bergstrom (2004) found that license agreements between nonprofit publishers and libraries were broadly beneficial to the scientific community. Despite this, society publishers have felt an asymmetric level of risk in the subscription market. As described by one publisher:

Our subscription revenue has been declining. We are a small publisher in the scheme of things when you compare us to [large commercial publisher] or even [large society publisher]. Our subscriptions are often cut. Although we are down at the bottom of the

pile in terms of cost, so you would think that it would not make sense to get rid of your low-cost publications, they're the easy ones to chop whereas the big bundles of publications, libraries are more reluctant to eliminate those. (NPSP06)

This comment reflects the (real or perceived) influence that larger commercial publishers wield over the budgets and time of librarians. Although relating to the sustainability of subscription revenues, rather than OA itself, these concerns exemplify the vulnerability that nonprofit publishers face in a tight and increasingly competitive market. As described by one society publisher, "In some ways the journal business is an attrition business, every year we see library budgets tightening, and a lot of scrutiny in terms of what they are subscribing to" (NPSP02). This tightening of budgets was often due to "federal and local government limitations that you can't predict, and frankly that libraries can't predict" (NPSP04).

Scholarly society publishers are limited in their ability to compete against commercial publishers largely due to structural constraints, i.e., small publishing operations and little market presence; limited access to equity markets, endowments, or capital reserves; a focus on core competencies of content acquisition and certification rather than business operation; and historical practices as conservative stewards of their respective disciplines (Crow, 2006). These constraints have often driven society publishers to enter into publishing partnerships with commercial publishers, allowing society publishers to generate income to support and focus on society functions, while consolidating the market position of commercial publishers (Fyfe et al., 2017).

Given the strong alignment with the values of nonprofit publishers, librarians should consider the reprioritization of their negotiation efforts and seek opportunities to provide assurances to nonprofits for financial stability to mitigate the risk of consideration of OA



business models. This also points to an opportunity for like-minded scholarly publishers—with a shared interest in achieving OA to research outputs—to organize together to achieve scale in discussions on collective funding approaches with librarians, rather than outsourcing their operations to a commercial partner.

Common across both society and commercial publishers was the concern that their costs associated with publishing were increasing, while library subscription budgets remained, as described by one commercial publisher “at best stagnant” (CMPR05). This absorption, or compounding of OA into other concerns faced by publishers, was also demonstrated in issues relating to the higher costs publishers were facing due to the increased volume of research activity and content published. As described by one commercial publisher:

Ever since I’ve been in publishing there has been a serials crisis; and now I think it is actually really beginning to bite. That is certainly what our sales reps are hearing; that they really are under pressure. So how do you marry those two things? Increasing output and a need to grow as a commercial organization, with your main customer base having less money available. And that is writ large. The research output continues to grow—the best guess is 3% per year—on 2 million articles per year because the world is growing.

There’s more people. More research. So how do you square those two things? (CMPR04)

The concern of increased publisher costs to support increased global research activity and output was further compounded by demands for increased investments in online platforms and services. As described by a nonprofit publisher, “At the same time that there is pressure to not pay more for the subscription because budgets are flattening...you have increased demand for features on the platform. So the squeeze is on the publisher because the revenue is flat and the costs are going up. How do you manage that?” (NPPA02).

The concerns expressed by publishers relating to revenue that placed them on the “OA is a liability” end of the response spectrum were largely related to systemic issues in scholarly publishing, such as flattening library budgets, increased publication volume, and demands for platform improvements. Although nonprofit and commercial publishers expressed reservations regarding revenue neutrality in the SET model, as opposed to nonprofit society publishers who were largely concerned with continuing to generate revenue of value to their parent societies and constituent members, commercial publishers asserted that their primary objective was “to turn a profit. And we need to make a profit for our shareholders” (CMPR04).

This notion was further unpacked by a commercial publisher, who—when considering the merits of a subscription-equivalent model—cited the importance of growth for shareholders, while continuing to focus on quality to remain competitive in the scholarly publishing market:

I think also for publishers, for commercial publishers, I think the ability to continue to grow is very important. And there’s lots of ways you can grow of course, but I think that also includes the ability to grow. I think that may even be true for nonprofits if they are large enough, because you do need to make sure that you can continue to cover your costs even in a nonprofit. For those in our group, those who have shareholders, being able to show that there is continued growth is an important sign to the market, that’s just the way it is. (CMPR03)

In this example, rather than accepting the revenue-neutral aspect of the SET model, i.e., sustaining existing financial relationships with libraries, and assuring the accompanying profits and surpluses—the publisher raised the perceived risk of the inability to achieve “growth” under the model, considering it a liability in a transition to OA. Given that libraries are likely to support a neutral transition—but strongly oppose one that increases costs—suggests that the two

stakeholders will need to engage on the specific issue of “growth” and whether the commercial publishers’ growth objectives are aligned with the values of the community to warrant engagement and support.

One commercial publisher representative raised the issue that their reported profit margins had been misreported and inflated, while acknowledging their fundamental profit motive for engagement in scholarly publishing:

I was talking to a librarian the other day on the evangelical end of the OA spectrum, and it doesn’t matter whether our profit margin is 40% or the 15% that it actually is whatever it is—a commercial organization is not going to employ several thousand people because we think it is good for humanity. We do it because we need that many people to run our business, run things effectively and smoothly, and yes we make a profit out of it. I’m happy to have arguments about levels of profit, whether true or false or appropriate or not, with anyone. (CMPR02)

This relishing of an opportunity to have an “argument” about profits, and the characterization of an OA supporter as being “evangelical” (i.e., prone to dogmatic arguments of OA as a “religion”)—and, by the same token, a surveyed librarian describing publisher profits as “criminal”—further suggests the need for meaningful and civil dialogue to take place between both sets of stakeholders with a focus on the betterment of the research enterprise, without being confrontational or using ad hominem characterizations of either stakeholder group.

*Conclusions.* From Henry Oldenburg's use of the printed periodical to be sold by booksellers in late seventeenth century Britain, to Oxford’s John Fell who strategically exchanged the rights of publishing certain texts granted to the University Press by Royal decree to the publishing

monopolists of London to secure the financial stability of its scholarly mission, advocates for the greater dissemination of scientific knowledge have long entered into financial arrangements with the forces of commerce. The advancement of scholarly communication necessitated strategic compromises in each instance, reconciling or leveraging commercial forces to advance the goal of improved scholarly communication.

As the de facto custodians of the knowledge commons, librarians have expressed their recognition of the commercialized environment within scholarly communications. This study demonstrates that surveyed librarians are willing to enter into arrangements with publishers to advance cooperative models for OA—in a reconciliation with the forces of commerce that have been the norm through much of the history of scholarly publishing. Yet these arrangements are likely to be conditional on greater financial transparency on the part of publishers, relating to costs and the levels and use of publisher profits/surpluses. In order to make progress towards the end goal of an open research ecosystem, it will likely be prudent for libraries to focus on the centrality of achieving OA as part of their mission, while making peace with the prevailing commercial forces in scholarly communications.

Publishers, both commercial and nonprofit alike, largely diverged from the positions of academic libraries regarding the financial neutrality of the subscription-equivalent transition model. The prevailing viewpoint across the group of publishers was that models such as the SET rendered OA a financial liability. Systemic issues in the current scholarly publishing climate under the prevailing subscription model were compounded by publishers—both commercial and non-commercial—to the extent that they prevented meaningful consideration of SET models for OA. Although for publishers these systemic issues may be more pressing than OA, and may bear on OA in a number of ways, it is important to note that they would likely persist whether under

the current subscription model, or under a subscription-supported transition to OA. These systemic issues pose unique challenges and merit their own focus and solutions. However, they should not collectively represent a justification of enduring with the suboptimal status quo in scholarly publishing.

The digital revolution has enabled a new paradigm of scholarly communication, and has the potential to enable “the cornucopia of the commons” (Rose, 1994), where greater value is generated in an information commons through greater use. The vastly expanded potential of the scientific commons, and the tragedy of the anticommons through the opportunity cost of maintaining the status quo (Heller, 1998), should provide sufficient motivation to publishers and librarians to explore collaborative modes of operation. These forms of agreement are likely to require compromises from both sets of stakeholders, but should be considered and balanced in the interest of greater social benefit.

Given that both commercial and nonprofit publishers tend to compound systemic issues prevailing in the subscription system, libraries need to work with publishers to identify, unpack, and work collaboratively on solutions for these issues where possible. Further, librarians need to clarify to publishers the levels of financial support they are willing to continue to provide for publishing services, and the financial transparency they will require from publishers, particularly relating to their use of surpluses/profits. In exchange, librarians may consider providing multi year agreements/assurance contracts to allow publishers to navigate and mitigate the risks in transitioning to an OA production-based publishing service model. These models would also involve the development of new sets of evaluative metrics for libraries and publishers to demonstrate the impact of their investments.

The strong alignment of values of nonprofit publishers with librarians indicates a readiness to cooperate in moving toward open access. The market vulnerability of these publishers in the face of commercial dominance will require specific focus and attention. A common issue across society publishers is that membership is often tied to subscriptions, i.e. reduced-price subscriptions are offered to society members as perk of membership (Crow, 2015). This further exacerbates the perceived risk of the transition to OA. On the one hand, societies use subscription revenue to support important society activities, which in turn support the quality of their published output. Even in a SET, however they must contend with potentially losing revenue from membership. On the other hand, making their journals more accessible may benefit societies in other important ways (Solomon, et al., 2016). A recognition of these concerns from librarians can support discussions on cooperative arrangements. Further, nonprofit publishers can strengthen their positions by entering into alliances with other like-minded nonprofits, a strategy that can help both societies and libraries achieve efficiency and scale in negotiating transitions to open.

Given that the issue of “growth” for commercial publishers was a significant barrier in the consideration of subscription-equivalent models, it is incumbent on libraries (as the main transactional partner) to address this specific issue with publishers. As in current subscription agreements, librarians are likely to agree to price increases justified by improvements in the value provided, backed by financial transparency from the publisher. OA advocates should further demonstrate to publishers that there is room for growth in business models that support OA, and the new revenue generating opportunities that an OA environment can enable—citing demonstrative examples where possible (from the OSS community or from the example of SCOAP<sup>3</sup>, for example). This notion was clearly expressed by a librarian: “I think that publishers

are generally more likely to pursue the path toward growth and greater profitability as long as that path is viable. I believe part of the incentive is to show publishers that this path may be the future, and that getting on board with this model may be in their long term best interests” (LBR184).

#### 4.1.3. The Prevailing APC Model

The SET Cooperative strategy was proposed as an alternative model to the predominant author processing charge (APC) model that has increasingly dominated the OA landscape throughout the past 15 years. The predominance of this model figured in the publisher interviews, in which all but one of the publishers revealed that they had an APC model in place—supporting the publishing of gold OA or hybrid journals within their portfolios of predominantly subscription-based titles.

Analysis of the responses of the publishers along the OA spectrum placed the majority as considering “OA as an opportunity.” This finding aligns with the research of Björk (2013), who highlighted how APC based OA has provided relatively low-risk new revenue stream for publishers—particularly in the context of hybrid journals—enabling them to collect both subscription payments from libraries as well as APC fees from authors. This was illustrated in the response of a representative of a nonprofit professional association publisher:

We see ourselves also moving in the direction of the hybrid model. What we found based on studying our peers is that the hybrid model does not introduce a lot of business risk—if anything it introduces upside in the short-term, which isn’t what it was intended to do, but it will be interesting to see. (NPPA01)

This upside, resulting from publishers of hybrid journals receiving revenue both from the payment of APCs and from library subscriptions—termed double dipping—is a common

objection to the model (Anderson, 2018). Yet the loss of this additional revenue stream now that it has become available, was considered a potential barrier to the adoption of the SET model, as “[p]ublishers would lose out on opportunities to convert existing subscription journals to author-pays OA and potentially recouping higher levels of revenue” (NPSP07).

The persistence of the APC model as an additional revenue stream for publishers was also recognized as by librarians as a possible disincentive for publishers in pursuing the SET: “Many of these publishers are double dipping—subscriptions and APCs—I wonder if they would be willing to give up APCs?” (LBR129). This point was reinforced by another librarian who considered that the (SET) “[s]trategy may be undesirable to large commercial publishing houses, which stand to benefit from the persistence of the hybrid OA model” (LBR024). This group of libraries (40.8%) constituted a point of convergence with the publishers on the APC model—recognizing the financial opportunity afforded to publishers—and its position as the predominant, proven mechanism currently used for advancing OA, as described by a respondent: “APC-based OA publishing is a viable strategy for many publications and many fields” (LBR111). Yet librarians were divided in their response to APCs as a model for advancing OA, as revealed in their response to Q.4.A. of the survey, in which they were asked to rate the favorability of various OA approaches.



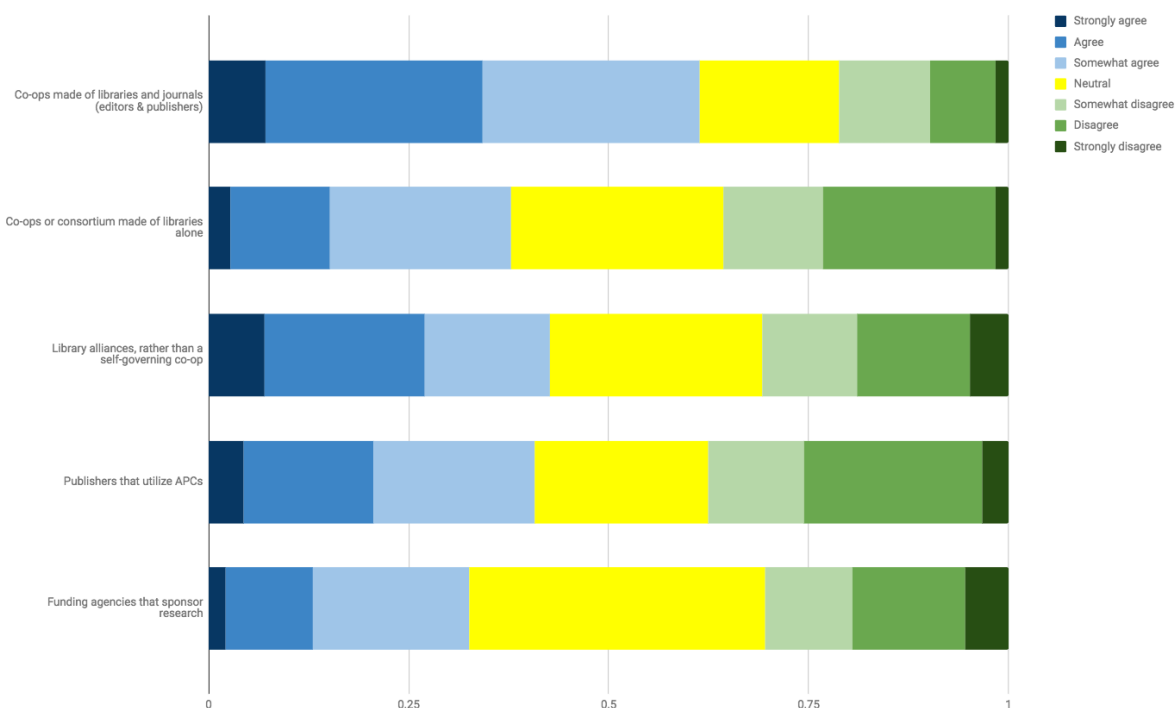


Figure 4.3. Response to Survey Question 4.A. The following organizations are best suited for supporting open access scholarly publishing (n = 184)

Among the diversity of models presented, the APC model received the highest level of disagreement (37.5%), suggesting that although some librarians acknowledged the success of the model, others considered it the most unfavorable for supporting OA; an almost equal divide between librarian respondents to the survey. As described by one librarian, “I think this model should be resisted. I feel it is a dangerous and undesirable revenue model that is not ultimately transformative. It is disappointing to see small society journals charge fees on par with large publishers,” (LBR123) aligning this group of respondents as viewing OA as a liability in the context of APCs. The APC model was also described as a financial liability by a librarian, who stated that: “At our university—a small research-intensive university—the model would result in a doubling of payments compared to current library subscriptions, this is unaffordable and would

not be paid” (LBR082). This comment reinforces the findings of the *UC Pay It Forward Study*, which found that transitioning the system of scholarly publishing to APCs would result in an inequitable financial burden being placed on research-intensive institutions (Smith, et al., 2016).

While some publishers recognized OA as an opportunity in the context of gold OA and hybrid OA, others described their APC-based publishing options as a matter of providing “choice” to authors, in effect stating their ambivalence toward OA’s centrality for advancing science, and relegating it to satisfying author needs. This also represented a divide in the positions of publishers on the APC model, with this group considering OA as being extraneous to scientific progress. This was illustrated by commercial publisher representative who proclaimed their company to be the title of the “world’s largest OA publisher” (by total number of APC-supported articles published):

We publish articles under both the subscription and open access models, [as] our focus really is on providing authors with choice, and ensuring that whatever we publish is of the highest quality. So for any journal that an author chooses to publish in, they have that choice between publishing open access (choosing gold open access within a publishing charge), or to publish under the subscription model, and to make a version of their article available after a time delay or embargo period. (CMPR01)

This notion of providing “choice” to authors was echoed by a nonprofit publisher who claimed, “I have to say we don’t get a lot of requests from our author community, or complaints from our author community that they want their articles to be open in ways that we don’t support” (NPPA2). Another nonprofit publisher further elaborated, “[W]hen we do author surveys, our researchers want quality, they want exposure for their content, they want quality editing, they want high impact journals, and then access is downways on that list” (NPCP01). That these

publishers would compound the issue of providing “choice” to authors—to publish free in subscription journals, or pay APCs for OA publishing in gold or hybrid journals—revealed the absence of the view that OA was integral to science; instead, these approaches were fulfilling a demand that was extraneous to the importance of OA in improving scholarly communication.

As studies by Björk have demonstrated, increasing numbers of publishers have recognized the opportunity provided by the hybrid model—and the number of journals adopting this model increased from approximately 2,000 in 2009 (publishing 8,000 articles) to more than 10,000 journals in 2016 (publishing 45,000 articles). Yet—perhaps due to a focus on delivering author choice—the APC model to hybrid (or fully supported gold OA) has not led to widespread adoption of OA (Björk, 2017).

Responses from the publishers suggest an explanation for the low adoption of hybrid APCs, and the ability of the model to transition publishers to fully gold OA. As described by one nonprofit publisher:

So at the moment the models that we have been looking at have been based on flipping journals to the APC model, flipping hybrids to APC. That obviously generates quite a big drop in income, because if you take our biggest journal, it’s probably getting about (\$6,000) an article in terms of subscription revenue. Whereas there’s no way we could charge that as an APC. So we would have to take quite a hit in order to do the right thing with open access, unless we can do it in a different way (NPSP04).

This response demonstrates the challenge that publishers, even those “who want to do the right thing” with OA, face in considering transitioning journals to OA, as the process requires time and careful planning (Solomon et al., 2016). The pitfalls of APC-based models suggest that

libraries and publishers engage to explore alternative mechanisms of achieving the OA transition.

In their response to evaluating different OA models, librarians indicated that they viewed cooperative arrangements with publishers, like the SET model, most favorably (61.4%) (Fig. 4.3). Librarians highlighted how models that involved both librarians and publishers stood greater chances of success: “The pendulum is swinging toward more open access resources in the scholarly world, so a model like this is timely. Given the advent and growth of websites like Sci-Hub, a model such as this provides more control and involvement of the publishers in the evolution toward open access” (LBR184). Working toward a common goal of advancing OA was also considered a mechanism to improve library/publisher relations: “It’s an interesting idea and would strengthen good will between libraries and publishers” (LBR079).

*Conclusions.* Despite the focus of this thesis on cooperative (i.e., non-APC) based approaches to OA, both sets of stakeholders frequently raised concerns relating to the APC model for OA. The reasons for this are likely manifold, including the pervasiveness of the APC model as the dominant OA business model (Piwowar et al., 2018), its high rates of adoption by publishers (Björk, 2013; Piwowar et al., 2018), including those surveyed; and its prevalence in existing OA transitional models (Laakso, Solomon & Bjork, 2016). Both sets of stakeholders were divided on APC-based OA, with some viewing it as an opportunity and others as a potential liability.

Among the surveyed librarians, 40% agreed that the APC was a viable transition model to support OA, particularly given the model’s documented success, and its contribution to driving the growth in OA in recent years, primarily through APC-based gold and hybrid models (Piwowar et al., 2018). In supporting the APC model, part of the library’s fiduciary responsibility

has shifted instead to research grants—which might provide budgetary relief for libraries closely tracking APC spends, but ultimately has led to higher expenditures, particularly at research-intensive universities. Some libraries have also set up APC funds (Tananbaum, 2014). Publishers similarly viewed the APC as a financial opportunity on the road to OA, demonstrated by the documented expansion of gold and hybrid APC models in recent years, and their use and application by practically all of the publishers surveyed. For publishers, the APC model has given them the ability to deliver “choice” to their authors, and paths to comply with funder mandates that require OA publication of funded research. APCs have also provided publishers with a new revenue stream, as they have been able—particularly in the hybrid model—to receive author fees from APCs, while also maintaining their primary subscription-based income source. For publishers, the APC represents a mechanism for the monetization of OA. Derived initially from funder mandates in the well-funded disciplines (particularly the biomedical sciences), APCs have provided the basis for the development of new pricing structures for publishers that have combined receiving income from authors with income from traditional subscriptions.

The practice of double-dipping by publishers was a factor contributing to the opposition of 37.5% of librarian respondents to the model (notably the highest level of opposition of any model presented in survey Q. 4.A.). Librarians from research-intensive institutions particularly related their concerns regarding the inequity of the financial burden of APC-based OA would have on their institutions, citing that for many, they would likely incur higher costs through APC-based models than they currently spend on subscriptions, as highlighted in the *UC Pay It Forward Study* (Smith, et al., 2016). Similarly, for publishers, the APC model was considered a liability if applied for supporting gold OA transitions (from hybrid journals or subscriptions), as

many claimed that their cost structures were too high to support exclusively APC-based OA business models, i.e., their cost per article would be higher than the market for APCs could bear.

In response, publishers are increasingly negotiating transitional models to address double dipping concerns from libraries with their own revenue requirements, and are arranging offset deals that include the payment of APCs and subscriptions. Critics of these transition models decry how the APC is enshrined into transitional models without adequate consideration of the associated pitfalls: given their inability to scale across disciplines (Armbruster, 2005; Björk, 2013), the unequal financial burden that would be placed on the most productive research institutions, and the barriers that these models represent for participation from researchers in under-resourced communities (Smith, et al., 2016), particularly those in lower and middle-income countries (LMICs) (Dallmeier-Tiessen, 2013; Feess & Scheufen, 2016) and the transfer of hyper-inflationary commercial practices from the subscription system to APC-based OA models (Khoo, 2019).

The impasse that currently exists between librarians and publishers in implementing APC transformative models at scale suggests that new forms of transitional approaches should be explored. The more positive view of cooperative models by librarians suggests that the two stakeholders need to engage in meaningful dialogue around the suitability and acceptability of this way of moving to open access. The evidence supports the exploration of alternative models in which libraries recognize and support publishers in the delivery of publishing services, and publishers engage with libraries in a financially transparent manner.

#### 4.1.4. Free Ridership

A point of convergence between both librarians and publishers was around OA as a potential liability, resulting from the issue of free riding, which is a common concern with collective

funding approaches. Free riding suggests that once a journal's content is made openly available, it would be in the economic self-interest of subscribers to stop paying, resulting in Hardin's tragedy of the commons (Hardin, 1968). This was demonstrated when the librarians were asked to identify why the SET was not a promising strategy for converting subscription journals to OA and initiating cooperative publishing: 61.4% agreed that the SET would require too great a level of agreement among subscribers (Figure 4.4).

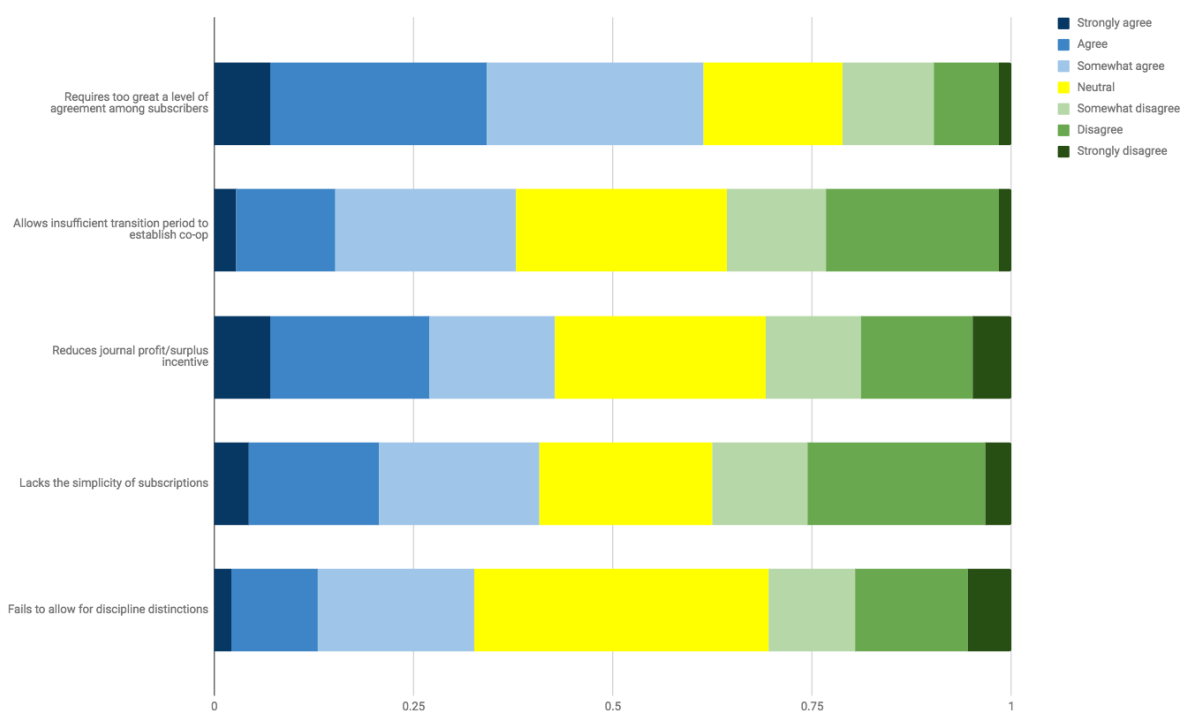


Figure 4.4. Response to Survey Question 2.A. The following reasons describe why the SET is not a promising strategy for converting subscription journals to open access and initiating cooperative publishing (N=184)

As surveyed librarian described the free rider challenge, particularly in the context of future potential budget cuts:

Even if it were demonstrated that this strategy could work in theory, the question of free riders will need to be dealt with early and rigorously. The question here is not so much whether librarians will be willing to continue ponying up the money to support a system like this—the question is how these librarians will respond when their funding institutions ask them "Why should we continue giving you hundreds of thousands (or millions) of dollars every year for collections when we could cut your budget by 25% and not lose access to any of this content?" (LBR086)

Similarly, librarians expressed their concern that the SET model did not sufficiently account for instability in library budget allocations, which might lead to attrition from the cooperative arrangement. As described by one librarian, "It [the model] also fails to account for the variability in library funding and the possibility that a participant may not be able to continue contributing if their funding gets cut" (LBR031). This point was further reinforced by another librarian who stated that: "There is also a risk that libraries will drop out if they're under financial duress and don't see an immediate local benefit (e.g., no longer have a program in that area, etc.). The model needs to be robust enough to be able to sustain some level of attrition" (LBR014). So the view of librarians was that although some sympathetic subscribers might support subscription-supported OA initially, over time, the inequity of paying while other institutions free ride would potentially cause more and more institutions—including those committed to OA—to withdraw their contributions. As described by one librarian, "Maybe I am thinking small, but this seems very hard to pull off successfully the broader the content/participation gets.



That is, the easier it would be for future decision makers to pull funding when I can get it for free anyway, if the institution doesn't have direct involvement in producing the content” (LBR092).

In the context of free riding, it is important to note that journal subscription models also represent a form of collective funding model, although not one that results in OA to content. For journals to be financially viable under the subscription model, they need to generate a significant amount of revenue from a broad base of subscribing institutions. Although there is certainly cross-subsidization across publisher portfolios, where the financial success of more lucrative titles tends to support nascent or financially failing journals, these models all require the collective support of subscription payments from multiple customers. Issues relating to attrition in subscriptions are handled by publishers in the subscription model regularly (due to economic downturns, material changes in library budgets, and currency fluctuations, for example), and similar mechanisms could be developed for collectively funded OA models.

In *The Logic of Collective Action: Public Goods and the Theory of Groups* (1965), the political economist Mancur Olson argued that mechanisms to overcome free ridership in the provision of a public good were dependant on the size of the group. Large groups could be motivated to collective action through coercion (e.g., government regulation) or through the provision of a selective benefit that would be contingent on participation, which would be difficult to implement to OA scholarly publishing given its requirements of free and immediate availability. Yet, Olson suggests that in intermediate and smaller-sized groups where the actions of members were coordinated and visible to one another, social dynamics and cohesion could prevent or limit free riding (Olson, 1965).

In the context of OA funding of journal publishing, subsets of libraries that have previously expressed demand for content—by definition the journal’s subscriber base—could be

motivated through an appeal to the values of the community. As many of the actions of libraries are already coordinated (through library consortia) and are typically visible to one another as public institutions, the conditions for social cohesion to sustain funding are well in place. Through the strong statement of their values made in this study—as well as in the results of existing cooperative models—academic librarians are demonstrating that their common values and purpose provide the necessary levels of social cohesion and incentives to sustain OA publishing.

Some respondent librarians did raise issues relating to institutional procurement policies that may prevent their participation in supporting OA resources: “Some public institutions might not be able to contribute to something they can otherwise get for free” (LBR031). Addressing this specific issue, a librarian invoked the common purpose of the library in supporting the SET:

There are library directors that are concerned about freeriders and therefore reluctant to support initiatives from which others who do not provide financial support will benefit.

However, I believe that there are many of us who do not believe that the existence of free riders should stop us from doing things that benefit our own institutions significantly, as this would, and that are a public good. (LBR140)

These statements suggest that both OA advocates and librarians need to work with institutional administrators to revisit procurement processes and budgetary regulations to support the redirection of library budgets from purchasing proprietary licensed content, to supporting publishing services for OA publishing. Given that libraries are the principal source of revenue for academic publishers, it is important for them to recognize that sustained financial support for scholarly journals valued by the research communities they serve will be largely dependent on their participation.

A librarian suggested that, as a start, libraries could begin to dedicate funds to invest in programs that support OA models: “I would recommend that we invest a small portion of our budget to engage in exploration of new models of scholarly publishing. This would include a collaborative initiative with multiple academic libraries to explore a publishing cooperative model, following an initial successful step of agreement on key principles. It would also include exploration of other models” (LBR118). This idea was furthered in September 2017 by David W. Lewis, Dean of the Indiana University-Purdue University Indianapolis (IUPUI) University Library, who recommended that libraries should set aside 2.5% of their library budget to support. Outlined in his paper, “Thinking differently about the money: A first step toward the Open Scholarly Commons”, Lewis describes the goals of establishing a norm across academic libraries to support an investment in common infrastructure to support open scholarship. Lewis demonstrates how, through focused attention on the problems plaguing scholarly community and the consequences of inaction, libraries could be motivated to change behavior and create incentives for “larger contributions to the common good” (Lewis, 2017).

Responding to the SET model, a librarian expressed how they could increase the impact of their collection budgets to achieve greater value: “I think there's often the unstated zero-sum idea that we don't want to pay for other institutions to have access. This model makes it clear that we'd be paying the same thing for universal access—so essentially by not going with this model we would be unnecessarily restricting access, which is counter to our mission as libraries and universities” (LBR169). In this instance, the librarian is not only stating their support for the model but also is providing an implied assurance to publishers that not supporting such a model would be counter to their mission.

Publishers—both nonprofit and commercial—considered OA as a liability in the context of free riding. According to a representative from a university press, responding to the SET: “I really like the idea that if you have got an existing community—however fragmented it is—supporting a journal, wouldn’t it be great if you could just let them continue supporting it while it is OA. There’s all sorts of practicalities around it; the biggest one really is avoiding the free rider issue, and not having organizations drop out” (NPUP01). Here, while acknowledging the importance and strength of the SET proposal building on existing relationships, the publisher voices similar concerns to libraries with regard to free riding in the SET model.

Furthermore, for some publishers—particularly those with large corporate subscriber bases—the focus of the model on academic libraries raised the issue of corporate free riding as a liability, specifically in the context of APC-supported OA, echoing the perspective of Beaudoin-Lafon (2010) discussed earlier. As described by a nonprofit association publisher:

Another part that is also problematic is the size of our corporate subscriber base. To me when people talk about the fairness in open access, and how much better it is for everybody, one of the questions that my mind is why is it fair that a university that has a good bit of authorship but limited resources, should be subsidizing the richest corporations in the world by paying for the publishing that those corporations then used to build for-profit products. (NPPA02)

This issue was also raised by a commercial publisher, specifically in the context of the OA2020 initiative, who said:

It’s also problematic, when you talk about the OA2020 initiative, thinking about how costs are redistributed in a fully gold world, the corporate sector and the way in which it currently subscribes and support that subscription base. In a fully gold world, they

become free riders... the corporate sector benefits from payments that are solely made by the academic library community. That changes the balance of who pays for research, and does raise questions about the sustainability for the academic library sector. (CMPR01)

For these publishers, collective models could be developed that engage and incentivize all subscribers—including corporate and nonacademic customers—in the OA transition.

*Conclusions.* A point of convergence between surveyed libraries and interviewed publishers that places OA as a potential liability was the shared concern around free riding by libraries in collective OA funding models. Free riding in collective models is certainly a concern for both parties, as it can potentially be damaging to both: significant free riding in collective models can lead to an inequitable burden of support on a few institutions and potentially lead to the inviability of the resource itself, a tragedy of the commons.

Yet, the work of economist Mancur Olson suggests that collective action efforts are viable if there are sufficient social dynamics and cohesion within groups to motivate and sustain the private provision of a public resource (Olson, 1965). This has been demonstrated in the example of SCOAP<sup>3</sup>, discussed earlier, which has effectively transitioned the publishing of research in high energy physics to a service economy for publishing services (Romeu et al., 2016). As well as demonstrating the power of libraries and disciplines in working collectively to transition and sustain content OA, SCOAP<sup>3</sup> has provided a powerful counterexample to the free-rider problem. Although there remain some institutions that have failed to participate on various grounds (with the notable example of Stanford), the SCOAP<sup>3</sup> consortium has grown to include more than 3,000 institutions in 46 countries (as of May 2019), rather than encountering a fall-off due to free-ridership.

SCOAP<sup>3</sup>'s achievements, with the participation of 3,000 libraries, are particularly remarkable considering that practically all of the articles published in their supported journals were already available OA in preprint form in the arXiv repository. A perhaps even more powerful counterpoint to the free-rider concern is that with the existence of Sci-Hub, libraries around the world have cancelled their subscriptions, although the existence of Sci-Hub has likely certainly placed pressure on publishers to seek viable OA publishing models and given libraries greater leverage to threaten cancellations in the absence of equitable and transparent OA models (Himmelstein et al., 2018).

This sustained support from libraries to publishers is consistent with their role as custodians of the knowledge commons throughout the history of scholarly communication, as well as the principal brokers of access for their communities in dealing with publishers. Just as publishers sold subscription access to libraries to advance the intellectual commons in the print paradigm, Ostrom's *Governing the Commons* (1990) begs a parallel structure for the digital age, in which librarians act collectively, leveraging their values as responsible custodians of the commons, and minimize risks in the OA transition for publishers by providing assurances of sustained revenue to continue publishing operations.

Similarly, publishers can begin to consider models that allow them to sell to the commons. This suggests publishers need to devise financially transparent means for demonstrating and delivering value to librarians with an emphasis on the quality of their publishing services in support OA content to ensure continued support and minimize attrition. Such models may provide viable opportunities for growth: in collective funding models, libraries want users with the ability and resources to carry part of the load, which through opening up content could help to identify new libraries beyond the existing audience of subscribers.

#### 4.1.5. Librarian and Publisher Relations

A particular point of divergence between the view of libraries and publishers on the OA response spectrum is the role that each stakeholder group would play in the transformative process.

Building on their philosophical alignment with OA, the SET Strategy was described by librarians as an opportunity for them to play a leadership role in the future of scholarly publishing.

Respondents asserted that the SET would represent “a very useful step for the libraries to be involved in the construction of a road-map that will show that way to publishers” (LBR184).

The opportunity for libraries to play a renewed role was further elaborated by a respondent who stated that the SET strategy would compel libraries to:

[work] more closely with the stakeholders in the communities they serve, not just as proxies for mediated access (spending money and managing access controls) but as advocates for a better user experience, fairer allocation of resources, supporting scholarly societies, etc. These are things libraries don't get to spend much time on, and researchers don't usually think are part of the library role, but if libraries can get away from just being spending and access control agents, they can put more emphasis in these other areas.

(LBR159)

This librarian is articulating how academic libraries can go beyond their traditional roles as a knowledge service provider to being an agent within the research ecosystem, a transition that is a product of the emergence of an open and diffuse research culture enabled by digital transformation (Lougee, 2009). With a distinct focus on improving the user experience and supporting services for researchers, libraries are aligning themselves with the inherent missions of academic publishers. As described by another respondent, “Libraries will be able to work more closely with faculty/scholars/researchers in the production, dissemination, and discovery of

scholarly content, which will strengthen libraries' role in the scholarly communication ecosystem and in the changing environment of higher education” (LBR047). According to survey respondents, librarians were likely well suited to adopt this role: “Librarians may have a better sense of what researchers, faculty and students do and how they use content on the ground” (LBR141). Such arrangements could also help to elevate the status of libraries: “It would give librarians a voice, practical experience, and justification to move forward with scholarship, publishing, etc. Issues where we currently have no credibility” (LBR097).

In expressing support for OA, a librarian noted how in their opinion, under the predominant APC-based OA model, the role of librarians is diminished: “Any collective plan to fund open access through library budgets is a great idea. If we let the big publishers own OA with author-side fees, access will be closed at the other end and nobody will think libraries should exist since now they're seen as basically a procurement office for stuff that will be free” (LBR144).

Another frequently occurring refrain from respondents was the notion of “taking control” of scholarly communication away from publishers and returning it to scholars, as asserted by one librarian: “The main reasons to pursue [the SET model] are to lower barriers to scholarly publications and put academic content in the control of the academy” (LBR118). This leadership view for libraries to transition scholarly publishing to an OA future was not, however, largely shared by publishers. Although two of the 20 publishers directly acknowledged librarians as their main transactional partner, others considered libraries as a middleman between them and their target community of scientists and researchers. As expressed by a commercial publisher reflecting on the SET model:



It [the SET] concerns me that it gets in the way of the relationship between the buyer and the seller. Librarians are already kind of the middleman (or middle woman as the case maybe). The ideal from a capitalist kind of perspective is that you go to the people that are buying your stuff and you say here's my stuff—would you like to buy it? And they say well, yes or no. But you can take that and go back and iterate: and you get this tight relationship, and this tight product-market fit which allows you to be more of what they want and do more things that they want. They get better services, you can make more money, that is kind of how things ideally would work. (CMPR01)

Publishers also displayed the tendency to describe libraries as being outdated institutions. While acknowledging the importance of libraries in a SET-type model, a representative of a nonprofit society publisher stated:

Yes there are relationships with librarians and we find that very valuable, and I think libraries are very valuable. Some of them need to reinvent themselves, some of the services they provide are the old caboose on the train that is there just because it needed a union position. But some of them are adapting very nimbly to serve researchers in the modern world, have different functionalities, etc. (NPCP01)

Although all of the 20 publishers stated that academic libraries constituted the majority of their subscriber base, these characterizations of librarians as either playing an intermediary role or as being outmoded contradicts the dominant view among librarians of their community being progressive and able to lead systemic change in scholarly communications. Meaningful cooperation between both sets of stakeholders implies that publishers need to respect and acknowledge the current and evolving roles of the library community as a principal stakeholder in scholarly communications.

Librarians specifically cited the lack of respect from publishers as representing a barrier to entering cooperative publishing arrangements: “I think this is a viable model in theory, but I worry about the ability of libraries and publishers to work together as described... Librarians and library staff are likely underpaid relative to similarly skilled publishing industry staff. Publishers routinely make public statements that degrade and devalue the work of librarians” (LBR077). Relating to the issue of financial transparency, librarians also expressed their skepticism that publishers would enter into collaborative arrangements in good faith. In describing potential barriers to establishing a cooperative, one librarian questioned “the presumption that honest data for publishing operations would be shared by publishers—there is a reason why all those contracts have non disclosure agreements” (LBR079).

Overcoming the barrier of a lack of trust and respect is a major hurdle preventing meaningful progress on OA models; but trust can be rebuilt through meaningful engagement between both stakeholders on key issues. Trust, in particular, being a two-way street. That is, the recognition of the importance of libraries by publishers in facilitating a transition OA needs to be met with a similar recognition by libraries of the value that publishers contribute to the scholarly communications process. Although trust may be challenging to repair with publishers whose profit-maximizing commercial practices damaged their relationships with libraries, librarians also must be careful not to generalize their mistrust across all publishers. For publishers, the willingness to provide greater financial transparency around costs, pricing, and the use of generated profits/surpluses will likely go a long way toward improving relationships between the two principal stakeholders.

*Conclusions.* True to their historical origins, librarians remain at the heart of scholarly communication, and have been adapting to the transformations occurring in the process of production and communication of science enabled by digital technologies. The role of libraries as key agents in the research process is enabled by their collective values, expertise in information curation and management, and mission to support the research enterprise—as they have done throughout history (Lougee, 2009). The finding in this study that librarians viewed themselves as having a key leadership role in collaborative models is consistent with the literature, which describes how libraries must now shift from being providers to being active promoters of the research lifecycle (Björk, 2007). The founding of Offices of Scholarly Communication, and appointment of Scholarly Communications Librarians in so many research libraries, is a strong affirmation of the role of libraries as active members of the research cycle at institutions (Bonn, 2014).

The Association of Research Libraries (ARL) consider the strategic repositioning of research libraries in the research ecosystem as a response to three main changes: first, the shift in focus of libraries as a service provider, to becoming a partner and active collaborator with the broader research system; second, that libraries are committed to supporting the research lifecycle, discovery, preservation of knowledge to support the mission of institutions, and advancing society more broadly; and third, that libraries would work (facilitated by ARL) individually and collectively to promote education, research, and social impact (ARL, 2016). This recasting of the role of libraries was reflected strongly in the response of librarians, who expressed not only their willingness to engage in new ways of advancing OA but also their desire to take a leadership role in the process.

Despite recognition of the status of librarians as the primary transactional partner for the interviewed publishers, they diverged in their opinions of the role of libraries in scholarly communications. When acknowledged by publishers, the role of libraries was relegated to that of an intermediary between them and their target audience (researchers), or as somewhat outmoded institutions. This apparent lack of the importance, or inherent respect, of the role for libraries is clearly an impediment to OA. Similarly, however, the mistrust of academic publishers and suggestions by librarians that they might not enter into discussions around cooperative models in good faith—is a demonstration of the lack of trust that libraries have in publishers; a further impediment to OA.

Scholars of organizational theory—particularly related to group dynamics—define trust as “the willingness to rely on another’s actions in a situation involving the risk of opportunism ” (Mayer, Davis, & Schoorman, 1995). Trust is a key feature of successful cooperation, which both secures and enables collaborative behavior (Williams, 2001). Where damaged, trust can be difficult to rebuild due to differences in values across groups, negative prior experiences, or power imbalances. On one hand, academic libraries may feel that publishers value revenues over advancing scholarship, and that they wield excessive market power. Publishers, on the other hand, may feel that their contributions to the research lifecycle are not clearly understood or valued by academic libraries.

Cooperative models that are based on open communication and financial transparency offer an opportunity to repair and build trust through clearer understanding of the specific desires and intentions of each potential partner. The expressed support from librarians toward cooperative approaches between libraries and publishers for OA was much stronger (with 61.4% agreement) than the support for a one-sided cooperative consisting of libraries and library

consortia only (with 37.8% agreement), or for the APC model (at 40.8%) (Figure 4.4) . This suggests that, despite the breakdown in trust, that libraries are willing to engage in cooperative OA models with publishers, and that they value the contribution that professional publishers bring to the research ecosystem. This recognition provides a starting point for meaningful engagement to advance OA models for the benefit of global scholarship.

#### 4.2. Overall Analysis

Analysis of the responses of librarians and publishers across the spectrum revealed significant points of convergence between the stakeholders with regard to their position on OA. The most notable point of convergence was the shared perspective between librarians (89% of whom expressed their support for the SET model) and the group of fourteen nonprofit publishers (composed of scientific societies, university presses, and independent publishers). Both groups considered OA as integral to scholarship, and strongly aligned with their organizational missions and values. Although the somewhat qualified statements of support from OA for two of the six interviewed commercial publishers placed them in alignment with librarians and publishers in this respect, the responses of the group of commercial publishers were largely divergent, considering OA to be a liability, or at best extrinsic to the future of scholarly communications. The strong convergence between the perspectives of librarians and nonprofit publishers suggests that they are primed for engagement on cooperative funding models for OA. The results demonstrated that partnership with commercial publishers will—perhaps unsurprisingly—likely prove more challenging. However, given the dominance of the industry by commercial publishers, they cannot readily be set aside if we are to realize an OA information commons. Cooperative partnerships with commercial publishers will require special focus and attention to the specific issues and concerns raised, and to devise appropriate collaborative solutions that

strike a compromise between the commercial values of these publishers and scholarly interests of the academic librarians.

Despite the overall embrace of OA as being integral to scholarship the majority of librarians (62%) and publishers (18 of the 20 interviewed) shared some common ground on at least one issue that situated OA as a potential liability to scholarly communications, namely the risk of free ridership. Librarians expressed their concerns that once content was made open under cooperative arrangements, that some libraries—particularly those under financial duress—would be compelled to attempt to free ride, degrading the degree of cooperation and placing the burden on a smaller number of institutions. Some librarians also raised the issue that institutional procurement (as well as State) regulations might prevent them from paying for access to content that they may otherwise be able to access for free. Publishers similarly raised the issue of free riders undermining the stability of an OA cooperative model. Both commercial and nonprofit publishers were united in this concern, particularly highlighting the issue of corporate free ridership if these models were supported exclusively by academic libraries. The perceived inevitability of free ridership affects both librarians and publishers equally, but also unites them in shared concern. This shared concern suggests the opportunity for cooperative solutions. The success of the SCOAP<sup>3</sup> model—which has only experienced growing levels of participation (Kohls & Mele, 2018)—provides a powerful example of how large groups of libraries can work collectively toward a common goal. Avoiding procurement policy pitfalls that might result in free riding suggests that librarians should consider revisiting institutional policies with an eye to encouraging longer-term participation and support for OA content. Similarly, publishers will need to revisit the ways in which they demonstrate and deliver value, to demonstrate the returns

generated through library investments, and through developing new services or private benefits that incentivize continued or increased participation.

In discussing the predominant APC-based model, both librarians and publishers were divided across the OA spectrum. At one end of the spectrum, the high adoption rates of APC models, particularly for hybrid journals, across publishers (19 of the 20 publishers) suggested they considered OA as an opportunity, converging with 40.8% of librarians who acknowledged the success of the APC model in advancing OA. Yet, a number of publishers, both profit and nonprofit, termed APC-based OA as delivering “choice” to their authors, in a manner that suggested that they viewed OA as being extraneous. Further complicating the picture, gold APC-based OA would not be viable for some publishers to sustain desired levels of revenue, and was thus considered a liability. This group converged with 37.5% of surveyed librarians who expressed the increased financial burden placed on their institutions, particularly for research-intensive institutions. These results highlight the complexity of the APC model and its limited applicability, but also its pitfalls in differing institutional and resource contexts. Librarians viewed cooperative models consisting of librarians and publishers considerably more favorably than the APC model: affirming once again the readiness of the librarian community to engage in alternatives to the dominant APC-based approach.

The SET model engendered a wholly divergent response between librarians and publishers with regard to the financial neutrality of the model. Although 85% of librarians embraced this aspect of the model, expressing their willingness to sustain existing financial arrangements with publishers to transition from paying for content to paying for publishing services, publishers—for profit and nonprofit alike—compounded concerns relating to the subscription model, preventing meaningful consideration of the SET strategy. Society publishers

in particular expressed concerns relating to sustainability of their publishing surpluses, which they have used to support society activities; funds that have become indispensable to their organizations. Nonprofit publishers further highlighted their vulnerability in a market where the lion's share of library budgets is consumed in big deals with large commercial publishers. This vulnerability heightens the risk they associate with transitioning to OA models. It is incumbent upon librarians to recognize this position of smaller society publishers—particularly given their strong alignment on OA—to provide assurances for their sustained financial support. It also suggests that smaller nonprofit publishers could consider entering into strategic alliances with other like-minded publishers, to achieve some scale in the negotiation of cooperative arrangements with libraries and library consortia. Commercial publishers expressed similar concerns to those of nonprofits, but—rather than being driven by a mission imperative—they stressed their need to continue to generate returns for their shareholders, and continue to generate growth in revenues. Given the market share that these commercial publishers command, transitioning their content to OA through cooperative approaches will likely require another moment of compromise. With the vastly more powerful potential benefits to scholarship resulting from establishing a global scholarly commons, librarians will have to give special consideration to collaborative models with commercial publishers. Librarians have indicated their willingness to move ahead with subscription equivalent arrangements with publishers—including the associated margins—provided publishers are willing to provide acceptable levels of financial transparency. Working in collaboration with commercial publishers to transition to a service model has the potential to end the monopoly over scholarly content, resulting in a more competitive market for publishing services—an outcome that has the potential to transform scholarship and open new market opportunities for commercial providers, as demonstrated by



OSS in the software industry. Whether libraries and commercial publishers are able to reach common ground—aligning the values of the library community with the profit-seeking and growth objectives of commercial publishers—remains to be seen.

Entering into good-faith negotiations around collaborative models has the potential to rebuild some of the trust that has eroded between librarians and scholarly publishers. Through their continued investments in academic journals despite opportunities to free ride, the library community has demonstrated their unfailing support of scholarly publishing as a key component of the research process. Rather than treating them as an intermediary, publishers must recognize their role as custodians of the knowledge commons, and equal partners in shaping a more vibrant future for global scholarship.

## Chapter 5: Conclusion

### 5.1. Money Is Fungible, But Values Are Not

On June 10th 2019, a new front emerged in the conflict for the future of scientific communication. The provost of the Big Ten Academic Alliance (BTAA)—a consortium of fourteen universities from the northeast and midwest of the United States—issued a joint statement, entitled “Sustaining Values and Scholarship” in which they reasserted the fundamental values of universities to “[create] and share knowledge” and their collective mission to “support the common good, equity of access, and the global impact of research and scholarship” (BTAA, 2019). The leaders of this consortium—representing institutions with over \$10 billion in research funding, more than \$190 million of collective expenditures on journals and representing 15% of the total research output of the United States declared that “[the] systems of sharing knowledge no longer work in support of the academic enterprise.” In what represents a clear warning shot to commercial publishers, the institutions of the BTAA acknowledged the actions of the UC system and major European library consortia, stating their belief that the scholarly communications system is at a pivotal moment in the shift towards a “sustainable and open ecosystem of publication” (BTAA, 2019).

The statement of the BTAA is the latest in a growing chorus of libraries who—recognizing the alignment of OA with the fundamental values of scholarship—are calling for collective action to drive the systemic transition of scholarly publishing to OA. While a number of new business models are underway to support increased levels of OA publishing, progress remains slow, and the goals of a “flipped” journal landscape by the year 2020 remain far out of

reach. The question remains: If there currently are indeed sufficient finances in the subscription system to support the transition of content to OA, how best do we reorganize the system to achieve that goal? It is certainly true that OA transition models will likely vary across different publishers, disciplines, and resource settings. The APC model, or variations of it, are likely to remain the most efficient and viable path to OA in the biomedical and other well-funded sciences, where funder mandates such as Plan S may be applicable. But what does that imply for the rest of scholarship? How are we to achieve the “flip” for lesser-funded scientific disciplines: the social sciences and the humanities, economics and business, or for research in education?

The model presented in this thesis, the SET Cooperative model, was intended as an example to focus the attention of librarians and publishers participating in this study on how the existing business and funding arrangements of the subscription economy can be deployed to augment the value delivered to the scientific community by supporting the transition of content to OA. Although a range of transformative approaches have been proposed, with a number of these underway, many of these require extensive negotiations, technical and workflow complexities, and may in effect be detracting from more straightforward approaches toward the flip (Mele, 2016). Rather than requiring a large upheaval of the business arrangements in the subscription system, the SET model was intended to suggest ways of working toward OA that conserve the existing subscription spends, transactional relationships, and workflows to facilitate the transition to OA.

Academic libraries have long served as custodians of the knowledge commons and as vital institutional centers of learning, instruction and the preservation of knowledge. Libraries are highly collaborative institutions, and work within and across sectors as a distributed network; sharing resources and expertise to ensure the broadest and most effective ways of delivering

access to information. Libraries share common values, enshrined into their professional codes of practice and ethics. The roles of libraries have been transformed through the digital transition, to go beyond their historical limits to physical buildings and campuses, to serve as catalysts and agents in a research process that can have outputs that are public. Libraries are natural supporters of open access: not only as advocates for their institutions and researchers, but as the primary customers of academic publishers and as supporters of free and equitable access to information.

This work demonstrates that librarians are continuing to uphold their core values, even in the face of the sustainability crisis in scholarly publishing. Librarians that participated in this study indicated their readiness to cooperate based on existing financial arrangements with publishers—both nonprofit and commercial—in a recognition of the promise of the intellectual commons to advance scientific enterprise. The library community is largely willing to sustain current levels of expenditures, including publisher profits and surpluses, provided that this gesture is reciprocated with financial transparency, particularly relating to how profits and surpluses are used.

Both librarians and nonprofit publishers have come to see the value of OA and envision OA being integral to the future of scholarship, a finding that suggests that these sets of stakeholders are ready to engage in cooperative models. Although non profit publishers have adopted commercial strategies to continue to survive in the oligopolistic publishing environment, they continue to uphold their respective missions, which remain well aligned with the values of the academy. In dealing with nonprofit publishers—particularly scientific societies—librarians will need to recognize the vulnerability that this group perceives in the current climate of commercial dominance of scholarly publishing. The subscription model has enabled society publishers to generate surpluses, which have become central to the support of society activities.

By indicating that they are willing to engage in expenditure neutral models with publishers, librarians have indicated to nonprofit publishers that their publishing surpluses are not under scrutiny. Nonprofit publishers—who are required to be at least somewhat financially transparent—will be able to enter into cooperative arrangements with librarians where they will be able to demonstrate how publishing surpluses support society activities, and consequently also support advancing knowledge in their respective disciplines, to which librarians will likely be receptive. Such arrangements will likely require librarians working together to provide assurances of sustained financial support—at least for a set period of time. Such collective commitments made by groups of librarians—leveraging their shared values around advancing global scholarship—have the potential to allay shared concerns relating to free riding. Building models on the basis of collective action principles that leverage the collective will of the library community to generate consensus and cohesion, can help to secure long-term stability and prevent the risk of free riding. Although currently limited by discipline and content type, models such as SCOAP<sup>3</sup>, the Open Library of the Humanities, and Knowledge Unlatched, are providing important empirical examples of effective cooperation.

The shared support for OA among nonprofit publishers along with their perceived vulnerability in a scholarly publishing market dominated by commercial publishers suggests that there may be opportunities for this group to act collectively, or at least in a coordinated adherence to common values, in transitional approaches. By working in this way, this group can achieve scale and efficiency in cooperative approaches, and gain leverage in negotiating with libraries and consortia; securing the focus and prioritization that is typically reserved only for commercial publishers.

The majority of librarians also expressed their willingness to support the transition of commercial publisher journals through subscription-equivalent models. Yet the findings of this study demonstrate that cooperative engagement with this group of publishers will likely be more challenging. There is an inherent misalignment in the values of the academic library community, with their remit to advance scholarship, and the values of commercial publishers who seek to succeed at scholarly publishing by generating revenue for their shareholders. Despite notable exceptions of statements of support, this group remained largely skeptical of simply moving subscriptions towards supporting of OA.

This situation places academic librarians in a dilemma. Given the oligopolistic control that the large commercial publishers exercise on the scholarly communications market, successful transitions of important scholarly journals cannot be achieved without including these publishers. Although librarians have indicated their willingness to enter into subscription-equivalent models with commercial publishers, the support of the library community often involves questions about whether the value that will be delivered through financial arrangements that liberate content from behind paywalls but sustain current levels of commercial publisher profits are tenable. Although the values of the two communities may be misaligned, OA advocates may be able to convince commercial publishers to enter pilot transitions under subscription-equivalent models, and to explore business models that—similar to the OSS community—are more focused on the delivery of publishing services than on content. Commercial publishers recognize the growing threats to their business model—from institutional efforts, funder mandates, and also from content piracy. Although this research demonstrates the willingness of libraries—with an eye to their historic mission of sustaining a global knowledge commons—to explore collaborative models at existing levels of spending but with reciprocal

financial transparency by publishers, the question remains whether commercial publishers will enter into cooperative arrangements under financially neutral terms to competitive service models for OA publishing.

With the year 2020 just a few short months away, the scholarly publishing community finds itself at a tipping point in the direction toward universal OA and also at an impasse with regard to the best ways of achieving this transition. Universities and libraries are fundamentally driven by the mission imperative to create and share knowledge. Research, scholarship, and education all rest on the ability to access and build upon the collective record of available knowledge. Yet the systems for sharing knowledge, which have always required a balancing of the values of commerce to advance mutually beneficial goals, may be missing out on what appears to be, and what many stakeholders are inclined to think is the best way forward for the scientific enterprise, which is universal OA. It may well be in effect, a tragedy of the anticommons. No longer confined to the limited potential of the legacy print system of scholarly communication, an entirely new ecosystem based on the fundamental values of openness is within our reach. The oligopolistic control of the market by a few large commercial forces has resulted in a moment of crisis, resulting from a collision of the values of libraries with commercial enterprise.

This work has sought to demonstrate that accelerated progress toward an open future is possible through degrees of cooperation among librarians and publishers. In particular, librarians and nonprofit publishers (societies, university presses, and independent nonprofits) share strong alignment of mission, and are ready to engage in cooperative approaches. Librarians are willing to enter into arrangements with commercial publishers, perhaps even with assurances for sustained financial support in exchange for reciprocal gestures of improved financial

transparency around publishing costs and surpluses. Ultimately, the future of such approaches will rest on the values upheld by the library community, and their willingness to reconcile their values to advance knowledge, with the publishing value delivered by nonprofit and commercial publishers to the scholarly enterprise. While nonprofit publishers appear primed for cooperating with multiple publishers, this seems more tenuous with commercial publishers and would require meaningful engagement on the key issues surfaced in this work to approach agreement. Any degree of cooperation around open access likely to require compromise from both publishers and librarians, but represent an opportunity to accelerate progress toward establishing a global knowledge commons.

Since this study was initially conceptualized, the forces at play in the OA landscape have shifted. In particular the funder community—through the ambitious Plan S—has powerfully lent its support towards transitioning the scholarly publishing landscape to OA. Funder mandates that threaten researchers with the withholding of funds for noncompliance are certainly one way to catalyze systemic change. Although the funders currently signed on to the coalition support only a small percentage of the world’s funded research, the scholarly publishing community has once again entered a period of critical assessment following the announcement of Plan S. A number of publishers—particularly smaller scientific society publishers—who have relied on their somewhat stable subscription publishing operations are now scrambling to identify viable pathways to comply with funder mandates. Although the compliance requirements (most notably the ending of support for paying for any hybrid OA) have been relaxed or delayed until 2023, Plan S runs the risk of driving the community towards unscalable and unsustainable solutions. An unintended consequence of this approach might be that society publishers would allow



themselves to be acquired by larger commercial publishers who would have the ability and workflows to manage compliance at scale, further strengthening their oligopolistic positions.

The emergence of Plan S, suggests an extension of this study to include the funder community, to assess the values they uphold at this critical moment in scholarship, and their willingness to engage in the OA transformation through multi-stakeholder cooperative models that involve librarians, publishers and the funder community. Such engagement has the potential to facilitate the transition to OA, by providing funder resources to minimise risks in the transition, while sharing the shouldering of the financial burden with academic libraries. New proposals, such as Willinsky's "Library and Funder" are beginning to make strides into this emerging area of scholarship (Willinsky & Rusk, 2019).

The methodological approach to this study limits the extent to which its findings can be generalized beyond the sample of librarians and publishers who participated in it. The recruitment method for the surveys—through popular North American listservs—could not yield a sample that fully captured the diversity of global scholarship. Similarly, the selection of publisher interviews—negotiated through my professional network of relationships—although collectively representing the majority of journals indexed in major (Western) databases, captured only the interests of the most prominent publishing houses in scholarly publishing, which hardly speaks to the breadth and diversity of the global scholarly publishing landscape. Although this study has an admitted Northern focus—due to much of the intellectual legacy of the modern scholarly journal, commercial publishers and university presses in Europe and North America—it does not capture the truly global nature of scholarship, or the diverse set of OA practices adopted around the world. Indeed much of the most progressive work in OA scholarly publishing has taken place in Latin America, through the ScieLo and Redalyc projects, relying on

government subsidies to publish scholarly work, with OA being the default mode of delivery (Alperin et al., 2011). Future research could glean the responses of stakeholders in research communities around the world to engage in a similar evaluation of cooperative models for support of OA scholarship to identify the values and considerations that emerge in these contexts. These studies could build upon the scientometric and quantitative approaches of scholars, such as the University of Montreal's Vincent Larivière and Simon Fraser University's Juan Pablo Alperin, complementing their quantitative work with qualitative, value-based assessments.

Research and scholarship seek to expand our understanding of the world, with a vital portion of this work tackling many of the issues that society must grapple with today, including those related to health and disease, aging, climate change, the environment, food and water security, the nature of the universe, biodiversity, crime and society's reaction to it, economics, and human behavior. The digital transformation of scholarship into something more closely resembling a global knowledge commons than anything since the myth-laden Library of Alexandria in the third century B.C.E. continues to be limited by structures that have been inherited from the world of print. The scholarly publishing industry's increasing reliance on the learned journal over the last three centuries has evolved this type of publication into a stable, authoritative, and useful source of knowledge that continues to hold much promise in its informing of responses to global issues. Given the accelerated urgency of these issues—particularly climate change and food and water security—the world cannot afford to continue to carry the opportunity cost of a scholarly communications system that is exclusive, inefficient, and suboptimal to what appears to be an unnecessary degree. It is time that this system be reorganized to deliver unfettered access to research and scholarship by building on and further

developing the emerging alignment of values among stakeholders toward this common and worthy cause.

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## Appendix A

### 1. Open Access Business Models

A diversity of business models have been employed since the movement's inception to sustain OA journal publishing. These models are included in the supplement to this thesis to describe the state of the OA and to help inform the analysis of the positions of libraries and publishers on the transition to OA through cooperative models.

OA business models have found various degrees of stability, largely depending on the specific research output being supported (i.e., articles, journals, or monographs). Although the following list is not exhaustive, it encompasses the most popular types of OA business models, particularly those of relevance to this thesis:

- Libre OA: provides full rights to users to use and re-use literature. This definition most closely matches the Three B's definition of OA as described in Chapter 1 (Suber, 2012)
- Gratis OA: provides only rights to read articles (also termed Bronze OA) (Suber, 2012)
- Green OA: where versions of articles (typically preprints) that are placed into free online subject-based or institutional repositories or archives (such as Arxiv in Physics, or BiorXiv in biological sciences) (Harnad, et al., 2008)
- Hybrid OA: includes articles that are published OA, but within predominantly subscription-based journals following the payment of an APC to the publisher (Laakso & Björk, 2012)

- Gold OA: encompasses articles that are published in an OA journal, also typically following the payment of an APC, and are indexed in the Directory of Open Access Journals (Archambault, et al., 2014).

Despite the diversity of models deployed, the APC-supported models, including Hybrid and Gold OA, has emerged as dominant, i.e., supply-side models in which authors (or their institution or research funder) pay an author publication charge to journals at the point of publication (Björk, 2013).

The proliferation of business models is a likely outcome owing to the varied interests and objectives of the range of stakeholders in the scholarly communication ecosystem. As described earlier, libraries are entering into collaborative arrangements with publishers to support OA publishing, and many have established institutional OA repositories for preprints and support the publishing of an increasing number of journals. The publisher market is stratified, and scholarly societies, associations, and independent and commercial publishers have all sought to maintain or enhance their market position in the wake of OA. Publishers active in OA can include those that were initiated with the purpose of publishing their content OA, i.e., “born-OA” publishers, or conventional publishers who have adopted OA publishing models, a cause of further proliferation of business models (Oppenheim, 2008). Further adding to the complexity, the degree of researcher awareness, attitudes, and experience relating to OA and OA models (i.e., self-archiving, or publishing in hybrid or gold OA journals) varies significantly across disciplines. Due to the proliferation of models and the resulting complexity, scholars have dismissed “one-size-fits-all” approaches as being likely ineffective (Brown, et al., 2007).

### 1.1. Green OA

Green OA publishing describes the activity of when author manuscripts—typically of articles that are eventually published in traditional subscription journals—are made freely available online, typically in an institutional or disciplinary repository. Björk, et al. (2014) describe green OA as being beneficial to readers (as manuscripts posted are usually close to the final published version), and also providing a mechanism for readers who are unable to subscribe to journals to access scholarly content. For institutions, these repositories have provided a mechanism for libraries to serve as custodians of the record of scholarly output of their research community (Harnad, et al., 2008). Typically low cost to implement—with open source archiving softwares (developed by institutions and libraries)—this form of OA is considered one of the most financially efficient paths toward advancing OA (Houghton & Swan, 2013). Furthermore, green OA represents the communal forces at work in academic libraries as they “are run predominantly using voluntary labour, open source IT platforms, and free hosting by a university or university department” (Björk, 2013). As most institutional repositories are largely supported by university staff and infrastructure—typically within libraries—their business models can be considered as institutional subsidies (Björk 2013).

The world’s first and largest repository, developed by the physics community in 1991 to share preprints, transitioned to Cornell University Library in 2001. Initially primarily funded by Cornell, *Arxiv* has since developed a new cooperative revenue model that spreads the costs across three sources: Cornell Library; a donation from the Simons Foundation; and a five-year, tiered financial pledge from university libraries based on their usage. Since its launch in 2013, *BioRxiv*, the preprint server for the life sciences, received its operating expenses from its host institution, Cold Spring Harbor Laboratories, and donor support from the Lourie Foundation, but

recently gained attention with the award of a multi year funding grant from the Chan-Zuckerburg Initiative (Callaway, 2017).

In a move that dismayed many in the scholarly publishing community, in May 2016, the multinational publishing conglomerate Elsevier purchased the *Social Science Resource Network* (SSRN)—an online OA preprint and manuscript database for the social sciences—for an undisclosed price. The acquisition drew swift criticism from many in the scholarly community, labeling it as a further example of the intrusion of commercial publishers into the OA arena, with one describing the purchase as “like if Monsanto bought out your favorite organic farm co-op” (Doctorow, 2016). According to Van Noorden (2016), the purchase of SSRN by Elsevier “exemplifies the morphing business strategy” of Elsevier, diversifying from primarily publishing journals to providing information services and data analytics to its customers (Van Noorden, 2016).

## 1.2. Open Access Journals

Although there are a diversity of business models to support the publishing of OA journals, this section describes the literature relating to models that influence academic librarians and publishers. The business models for OA journals include traditional journals that have transitioned from subscriptions, as well as new entrants into the OA market, i.e., “born-OA” publishers (Oppenheim, 2008).

### 1.2.1. Article Processing Charges (APCs)

Across the range of OA models, the supply-side APC model emerged as the predominant OA business model in scholarly publishing. However, the embrace of the APC model by commercial

publishers has led to major critiques of the model, with some characterizing it as representing an intrusion of commercial/capitalist values on the knowledge commons.

The importance of APCs has grown since their introduction in the early 2000s. The majority of OA journals, i.e., gold OA, as well as most born-OA publishers, utilize the APC model to finance their publishing operations. The vitality of the APC model has been demonstrated by its proliferation: increasingly applied by a growing number of publishers to support their OA content, as well as enabling new entrants into the journal market. Academic publishers have in some cases consolidated their market position through acquisitions—such as the purchase of BioMed Central by Springer in 2008—or they have launched OA megajournals, following in the footsteps of PLOS ONE, such as *Sage Open* or *Scientific Reports* owned by Springer Nature (Björk, 2013). Nonprofit university press publishers have also embraced the APC model; for example, Oxford University Press' Oxford Open program, which offers APC options between £1,000 and £2,500 for 230 journal titles included in their publishing portfolio (Björk, 2013).

The APC model has received intense criticism on several grounds, particularly from within the scholarly community. Scholars argue that the APC model simply transfers the market inefficiency for librarians in the subscription model to authors in the APC model. APCs themselves have been cited as a main barrier to OA among the academic community, with 39% of respondents of the Study of Open Access Publishing (SOAP) survey of 40,000 academics worldwide citing the requirement for having to pay a fee to publish as their primary reason for not publishing in OA journals (Dallmeier-Tiessen, 2013). The top-ranking journals using the APC model have author fees that range from US\$ 2,500 to US\$ 5,000; average APCs for hybrid journals are approximately \$3,000; for mega journals the average APC is \$1,300 (Spezi, et al.

2017). Of the journals that charge APCs listed in the DOAJ, the average APC in 2010 was \$900, which remains a significant financial barrier for researchers in underfunded disciplines, or in under-resourced research communities (Björk, 2013).

The embrace of the APC model by commercial publishers is considered by researchers to have had the effect of driving up average APC costs across OA journals. As an example, prior to its acquisition by Springer, the APC fee charged by BioMed Central was \$500, which increased to between US\$ 1,500 and \$2,800 following the merger (Björk, 2013). Some scholars have argued that this form of hyperinflation of APCs would be controlled by author price-sensitivity, who in a competitive market would choose to publish in more affordable journals (Pinfield, 2013). These controls have not borne out — largely due to the fact that authors chase prestige in publishing outlets over the expense of the APCs (Björk & Solomon, 2014; Pollock & Michael, 2019). A recent study found that “publishers are adept at pricing journals according to the prestige value of the title and the funding available to authors in each market” (Khoo, 2019). As a result, increases in APCs are exceeding the rate of inflation three-fold, and according to the author “will ensure that APC-funded open access will merely be a sequel to the serials crisis,” placing greater financial strain on institutional and library budgets (Khoo, 2019).

As discussed earlier, further criticism of APC-supported OA has been the shifting of incentives for publishers, from publishing articles of high quality to ensure successful subscription demand by libraries, to instead focusing on publishing volume to secure sufficient revenue from APCs, at the potential expense of the quality of research (Crow, 2009). Bohannon argues that these practices would eventually backfire and have negative reputational consequences for both the journals and the publisher (Bohannon, 2016). These factors imply that

there should be no material difference between the quality of content published in OA journals as compared with traditional subscription journals.

The potential for increased marginalization of researchers in under-resourced communities is also a concern around APC-supported OA. According to Feess & Scheufen, “switching from a closed to an open-access mode is likely to increase the gap between researchers from top and mediocre universities” (Feess & Scheufen, 2016). These concerns are particularly acute when considering the economic position of researchers in the Global South, who have long struggled to gain access to research content due to the prohibitive price of subscriptions, and would be prevented from publishing in OA journals due to the levying of APCs (Feess & Scheufen, 2016).

Others have raised the issue of the disproportionate costs for APC-based OA for research-intensive institutions, with concerns that certain organizations may benefit by free-riding off APC-enabled access paid by research institutions and libraries. According to Michel Beaudoin-Lafon, “those who benefit the most from this model are neither the scientific community nor the general public [but] the big pharmaceutical labs and the tech firms who publish very little but rely on the publication of scientific results for the businesses” (Beaudoin-Lafon, 2010). Other scholars have highlighted that for research-intensive institutions, payment for APC-based OA for all of their research outputs might require spending above current subscription levels (Muller-Langer & Watt, 2013)..

Finally, the lack of research funding in some key areas of scholarship—particularly social sciences and the humanities—renders the APC model unsuitable (Armbruster, 2005). For these disciplines, Armbruster argues that cooperative funding arrangements between libraries,



publishers, and potentially funding agencies could more readily support OA publishing (Armbruster, 2005).

### 1.3. Hybrid OA

The hybrid OA model allows for the payment of supply-side APCs for OA articles to be published in journals that continue to have demand-side (i.e., subscription) models for the remainder of their content. For publishers, the hybrid model allows a relatively low-risk path for them to meet author demands (or funder mandates) to publish articles OA. In fact, hybrid publishers have been able to capitalize on this model by securing two distinct funding streams, which has resulted in accusations from libraries of double-dipping by publishers. The recent growth in hybrid OA demonstrates how the values of commerce have intruded into the commons-driven objectives of OA publishing. Although the uptake of hybrid OA among publishers was initially limited, commercial and nonprofit publishers alike realized the income potential of the model. In 2009, approximately 2,000 journals offered hybrid OA and published around 8,000 articles; by 2016, 10,000 journals offered hybrid OA options, publishing around 45,000 articles (Björk, 2017).

Pinfield & Middleton highlight the double-dipping concern for libraries, noting that “in the short term institutional level sustainability remains a challenge,” particularly as librarians are faced with escalating prices for both journal subscriptions and APCs. They suggest that subscription costs for libraries should be adjusted downward commensurate to their total hybrid APC spend (Pinfield & Middleton, 2012).

#### 1.4. Institutionally Subsidized OA

This business model for OA journals is potentially very broad and can encompass many forms of support: financial, infrastructure, in-kind support, etc. This breadth means that the number of journals encompassed by this category is potentially very large (Crow, 2009). Subsidies can be provided by university departments, libraries, library consortia, funding agencies, etc. The approximately 600 journals supported by the 80+ member institutions of the Library Publishing Coalition are all operated under institutional subsidies from their parent institutions, as well as supported by the consortium itself (Lippincott, 2016). Another prominent example of this model is the journal *eLife*, which is financially supported by the Wellcome Trust, the Max Planck Society, the Howard Hughes Medical Institute, and the Knut and Alice Wallenberg Foundation.

## 2. Subscription-to-OA Transition Models

Given the review of the commodified market of academic journals, and the OA movement that is seeking to counter commercial forces, this section focuses on research on models to support the transition of subscription journals to OA and explores current approaches. This section sets the scene for librarians and publishers to consider an alternative transition model presented in this thesis, which is informed by existing approaches.

The momentum supporting the transition of journals from subscription-based to OA business models—or “flipping” as it has come to be known—has resulted from a number of driving factors, including funding agency mandates (Van Noorden, 2018), economic necessity (Daught, 2012), protests from the academic community (Heyman, et al., 2016), and revolts from the editorial boards of journals (Jaschik, 2015). It is estimated that about one-third of all of the journals listed in the DOAJ are the result of flipping from subscription to OA models (Solomon, et al., 2013).

The intrinsic benefit of transitioning to OA is the removal of the financial barrier to access. As has already been established, transitioning to OA results in significant increases in readership, as well as potentially higher citation rates. In some cases, the flip to OA can be a financial benefit: there are a number of examples of journals that struggled to survive in the subscription market, but have thrived under OA models (Daught, 2012). In particular, this has been found to be the case for high-quality journals in niche disciplines, where they might struggle to gain a broad enough subscriber base for sustainability, but whose authors might have sufficient interest in OA to sustain an APC-supported business model. Commercial publishers might consider them a financial burden, and are likely to release the journal or society from its commercial contractual arrangements to pursue an OA model (Laakso, et al., 2016).

Increasing journal revenue can be a potential incentive for transitioning to OA for society, nonprofit, as well as commercial publishers (Laakso, et al., 2016). For some publishers, such as that of Hindawi, it is possible the subscription market is already over-crowded with established commercial players, leaving no room for the entry of a new subscription publisher. With library budgets already stretched out from big deals with larger publishers, Hindawi was able to secure a successful, and profitable, business model by transitioning their entire portfolio to OA (Peters, 2007).

From the librarian perspective, OA flipping models have raised a number of challenges, including the shift of financial support from readers to publishing researchers, their ability to evaluate the value of their spending, and how to navigate the increasing influence of funders who mandate OA. Despite their overall support for OA, the large financial disparities between institutions, combined with the inconsistent and intransparent financial deals with publishers,

leads librarians to be wary that influencing the transition from subscription to OA will be fraught with challenges (Levine-Clark, 2018).

There are two primary mechanisms for the transition of subscription journals to OA: APC-supported transition models, and non-APC transition models.

## 2.1. APC-Supported Transition Models

APC-Supported Transition models imply a reversal, or “flip,” of funding source for journals, from reader-pays subscription-based models, to author-pays OA business models.

### 2.1.1. APC Offset Model

The most prominent of the APC flip models is the offset model, briefly described in Section 1.6.5, in which APCs are included in subscription license agreements with large publishers. These models are typically implemented at the publisher level for entire portfolios of journals and are not applicable to individual titles. They can, however, affect how publishers decide which journals to transition to OA, as well as the quantity and quality of article submissions that these journals receive (Laakso, et al., 2016). The precise mechanics of these offset models are mostly unknown, as they are protected by business-confidentiality clauses of major commercial publishers that require nondisclosure of contract terms.

The German publishing conglomerate Springer-Nature has largely pioneered the offset agreement and has deals in place with the Max Planck Society, as well as with a number of university and library consortia across Europe (Springer, 2016). In these arrangements, for the price of the total subscription to Springer’s content, authors from affiliated institutions of each respective consortium are able to publish their works OA in Springer journals. Offsetting agreements have also been developed by a number of other publishers, most notably Wiley,

Taylor & Francis, Sage, the Institute of Physics, and the Royal Society of Chemistry. Offset models typically have taken two distinct approaches, namely Read and Publish, and Publish and Read agreements.

In Read and Publish agreements, payments to publishers for subscription access to their content also covers payments from author APCs at no additional charge. As noted by Wise & Estelle (2019), in some instances in countries and research communities where researchers contribute a high percentage of content to journals, additional money is made available (although, to control costs, some consortia choose to cap the number of published articles). Examples of Read and Publish in place include publisher arrangements with libraries in the UK, Sweden, Holland and at MIT. In April 2019, following a number of high-profile cancellations, Elsevier signed its first Read and Publish agreement with UNIT, the national OA coordinator for the consortium of public research libraries in Norway. What makes this agreement distinct, compared with Elsevier's failed negotiations with other consortia, is that UNIT seems to have been willing to increase its total spend with Elsevier. The OA advocate Jon Tennant, criticized the deal, saying "It is absolutely unclear what these funds are being spent on... It seems like the amount being charged is 'this is how much revenue we get from you now, and this is how much OA you can get whilst sustaining that revenue,' and completely divorced from the true costs of publishing within an effective, modern communication system" (McKenzie, 2019)

In Publish and Read models—like the one recently struck between Wiley and Projekt DEAL—consortia pay an agreed amount for OA publishing fees of their authors, and access to the subscription content is provided at no additional cost. According to Wise & Estelle (2019), this model provides greater alignment with article outputs and total library spend, but could be challenging to implement across consortia. According to the authors, "There will be winners and

losers to manage, and a more gradual approach to rebalancing could sometimes be helpful” (Wise & Estelle, 2019).

#### 2.1.2. Other APC-based models

Other examples of APC transition mechanisms include implementing short embargo periods for a fixed period of time, usually 6 to 12 months, a practice termed Delayed OA. Delayed OA can serve as a positive step in a pathway to transition to OA, allowing journals to generate generate APC revenue for recent content until they are able to reach financial sustainability (Bird, 2010).

In other cases, strained relationships between publishers and editorial committees can act as a trigger to journals seeking alternative arrangements that are more in line with the values of the journal. One scenario here is for journals to transition from typically subscription-supported publishers, to those that have more experience publishing with hybrid-APC OA publishing. Transitions of this kind have generally benefited participating journals (Busch, 2014). A highly publicized example of was the 2015 resignation of the editors and editorial board members from one of the top linguistics journals *Lingua* published by Elsevier, in protest of their pricing policies and unwillingness to consider an OA transition model. Unable to take the journal name with them, due to its control by the publisher, this group of linguistics scholars established the journal *Glossa*, now published by the Open Library of the Humanities (Baković, 2017).

#### 2.2. Non-APC Models / Cooperative Models

As has already been established, APC-funded OA dominates the current landscape, although its widespread adoption has resulted in an uneven distribution of OA across wealthier disciplines and institutions. To counter this imbalance, as well as many of the described pitfalls of APC-based OA, a number of examples of cooperative models are emerging in OA publishing that seek

to go beyond the APC model. These models are being encouraged by groups such as OA2020, who are encouraging libraries to repurpose subscription budgets “to support non-APC-based OA-publishing models, and to support local and regional OA publishers and journals” (OA2020, 2019).

### 2.2.1. Consortium or Library Subsidy Model

A number of successful examples of consortium and library partnership models are emerging to transition subscription content to OA. With collective participation from multiple institutions acting in coordination, these partnerships are typically used to transition multiple journals. These models aim to redirect funding spent on subscriptions to journals toward collective funds managed by the library consortia to underwrite the costs of transition of the journals to OA, with the aim that the efforts are expenditure-neutral for libraries (although there may be some costs of organizing/managing the consortia). These models seek to leverage community incentives for participation, as the more members that participate, the less funding is required from each member; there is therefore a social/participation incentive for institutions to join as members, as well as for existing members to recruit others to the consortium or collective.

A leading example of this form of cooperative model is the Sponsoring Consortium for Open Access Publishing in Particle Physics (or SCOAP<sup>3</sup>), an international consortium organized by the European Organization for Nuclear Research (CERN) that has converted traditional closed-access high-energy physics journals to OA. The Open Library of the Humanities (OLH), which publishes 24 OA journals, operates on a library subsidy model, where the costs of their publishing service are borne by a community of around 200 libraries, with more libraries signing up to support the model, which is a strong affirmation of their collective values to support resources that go beyond serving only their institutional communities. Knowledge Unlatched

(KU) is a similar example—which began in 2013 with a selection of monographs supported by around 300 libraries—and has now grown to become an aggregate provider of 17 different OA publishing services, covering 1,250+ monographs and 19 journals, and is supported by a network of 575 libraries (as of May 2019).

### 2.2.2. Publishing Cooperatives

Publishing cooperatives provide an alternative mechanism for transitioning subscription-based content to OA, with multiple stakeholders working together with a common purpose, in the spirit of the forms of cooperative organization proposed by Ostrom (1990). First described by Raym Crow of SPARC in 2006, the scholarly communication cooperative is proposed as an alternative organizational and financial structure that may help to advance “[the] twin imperatives of financial sustainability and mission fulfillment,” (Crow, 2006) and also support nonprofit publishers and journals counter the constraints of a market that is dominated by commercial publishing entities. Crow describes how publishing cooperative structures can allow nonprofit journals to retain control of publishing operations (rather than outsourcing to commercial publishers) and to benefit from greater cost efficiency, stability of income, and lower risk through collective action. Members of the cooperative are able to benefit from increased bargaining power via economies of scale, increased market presence, and circulation of journal content, as well as the provision of business management services.

In the absence of an enabling framework that can provide for the financial needs of publishing while balancing the mission of societies and nonprofit publishers, flipping models have not been feasible for journals in many disciplines or from smaller publishers for whom APC-based transition models are not viable. Under the umbrella of a cooperative, society and nonprofit publishers may consider business models and access policies that collectively would



represent less risk than acting alone, allowing them to transition from more defensive strategies to more forward-thinking and progressive models (Crow, 2006).