

Research in Brief

Modelling a Cooperative Approach to Open Access Scholarly Publishing: A Demonstration in the Canadian Context

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ABSTRACT

Background In light of increasing interest in open access publishing, this Research in Brief proposes and presents a financial analysis of a cooperative approach to moving subscription journals to open access.

Analysis The article utilizes a 2014 survey of Canadian scholarly journals as well as an earlier 2004 survey to demonstrate the ways in which a cooperative model can mitigate publisher risk and sustain open access.

Conclusions and implications The study sets out the financial details of moving the “average” Canadian subscription journal to open access with the support of its previously subscribing libraries, in ways that need not involve a publisher revenue loss or a library expense increase.

Keywords Journals; Open access; Financial modelling; Canada

RÉSUMÉ

Contexte Vu l'intérêt croissant pour l'édition à libre accès, cette Recherche en bref propose et présente une analyse financière d'une approche coopérative à bouger les revues d'abonnement à l'accès libre.

Analyse Cet article utilise un sondage de 2014 des revues scolaires canadiennes ainsi qu'un sondage auparavant de 2004 à décrire les façons dont un modèle coopératif peut réduire le risque d'éditeur et maintenir l'accès libre.

Conclusion et implications L'étude expose les détails financiers de bouger la « moyenne » revue d'abonnement canadienne à l'accès libre avec le soutien de ses bibliothèques qui lui s'abonnent précédemment, dans des façons qui n'impliquent pas une perte du chiffre d'affaires d'éditeur ou une augmentation de la dépense de bibliothèque.

Mots clés Revues; Accès libre; Modélisation financière; Canada

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Within the broader research community of government and private funding agencies, commercial and non-profit publishers, and research libraries and scholarly societies, open access to research and scholarship is broadly recognized as a desirable goal. Yet there are disagreements aplenty about how to get there. Studies indicate that about half the recent literature is now made open online by its authors and publishers, if not always legally (Archambault, Amyot, Deschamps, Nicol, Provencher, Rebout, & Roberge, 2014; Jamali & Nabavi, 2015). Making the rest of this literature open, including the great wealth of back issues, and doing so in a sustainable way that advances the quality of scholarly publishing, is the challenge of the moment for those concerned with the advancement of learning.

The one open access financial model that has had some success, with authors paying article processing charges (APCs) utilizing their grants or institutional funds, has been employed by major corporate publishers, such as Springer Nature and Elsevier, and the major non-profits such as the Royal Society and PLOS. Yet this model has made little headway in the social sciences, humanities, and other fields with relatively low levels of research funding, with at least one survey showing author opposition to the general proposition of monetizing research dissemination (*Open Access Survey*, 2013). At the same time, the pricing of APC is showing some of the hyperinflationary tendencies of journal-subscription fees (approaching \$6,500 an article at the high end for *Nature Communications*, for example), with funders beginning to place caps on APC allocations (all financial figures in this article are in Canadian dollars).¹

The promising, if far less developed or documented, approach to open access this article examines takes the form of collective and cooperative action among research libraries and publishers. Among the international examples, SCOAP₃ (Sponsoring Consortium for Open Access Publishing in Particle Physics) has assembled some 3,000 libraries that collectively purchase open access to 11 particle physics journals. The Open Library of the Humanities and Knowledge Unlatched, with 16 open access journals and 449 open access books, respectively, are also collectively supported by libraries. Moreover, in a similar spirit of underwriting openness in scholarly communication, libraries are contributing open source software tools for preservation with LOCKSS (Stanford), for repositories with DSpace (MIT), and for journal publishing with Open Journal Systems (Simon Fraser University).²

In the case of Canadian journal publishing, this sort of cooperation is found in the 36 research libraries that host installations of Open Journal Systems (OJS), enabling 270 journals to manage their workflow and publish online (see Table 1).³ Among these library-hosted journals, 49 (18%) are subscription journals and 178 (66%) were born open access. Perhaps the most promising aspect of this library support is that 43 (16%) of these journals have moved from subscriptions to open access (judging from these journals' pre-1995 start date). *The Journal of the Entomological Society of British Columbia*, dating back to 1906, is the oldest of the open access journals. The subscription journals in this list have relatively low institutional subscription fees—from \$20 to \$480 in 2016—with all but five journals offering readers open access after an embargo period ranging from six months to five years, in a step initiated by the *Canadian Journal of Communication* in 1994 (M. Felczak, personal communication, September 16, 2016).

Table 1: Canadian journals by economic model, grant, and back issues hosted by 36 research libraries in 2015

Journal model	Titles	SSHRC aid	All back issues online
Subscription	49 (18%)	18 (45%)	37 (32%)
Flipped to open access	43 (16%)	10 (25%)	35 (30%)
Born open access	178 (66%)	12 (30%)	43 (37%)
Total	270 (100%)	40 (100%)	115 (100%)

As for how a spontaneous jump to open access might occur, the sociologist and journal editor Kevin D. Haggerty (2008) has described moving the well-regarded *Canadian Journal of Sociology* to open access as “taking the plunge”. Prior to the move, he was advised by his then university press publisher that it would be “an uncorrectable mistake.” His financial model for open access was three-part, relying on a) the Social Sciences and Humanities Research Council continuing its funding of the journal (SSHRC 2017); b) the University of Alberta Libraries providing hosting and technical support (as the university had long been the home of the journal); and c) use of Open Journal Systems for a management and publishing platform.⁴ Haggerty continues to edit and publish *CJS* under this same model to this day, with modest increases in the number of articles published and the journal’s impact factor.⁵

The Kevin Haggartys of the scholarly publishing world are called “early adopters.” For those editors, publishers, and societies working with subscription journals who are not prepared to take *the plunge*, this article attempts to provide the basis of a more informed consideration of this cooperative approach in the Canadian context. Given the interest in open access noted above, some of those involved in publishing subscription journals might feel that they deserve more than exhortations to go open. In light of the challenges faced by journal publishers and editors asked to give up a regular revenue source for a model with which few have experience, this study sets out the financial logic of an open access model that builds on libraries’ demonstrated commitment to open access. It uses a recent study of Canadian journals to provide a relatively detailed financial model of how the average Canadian subscription journal might move to open access without suffering a loss of the revenue that sustains it. The model incorporates both subscription journals and existing open access journals, given that these open access titles account for, by the rough approximation that *Ulrich’s Global Serial Directory* provides, some 35 percent of the approximately 700 peer-reviewed journals in Canada.

Some may ask why even bother with immediate open access, if subscriptions rates, at least for those journals already hosted by Canadian research libraries, range from \$20 (*Newfoundland and Labrador Studies*) to \$480 (*Canadian Journal of Hospital Pharmacy*), and since many journals provide delayed access after an embargo period. For the general public sitting before a terminal in a public library or at home, having to subscribe at any price—or face an embargo of any period—on encountering an article is likely to end the reader’s interest in the work in question. Our studies of U.S. physicians found that encounters of a “paywall” separating them from access to a re-

search article left a strong negative impression about access to the literature as a whole, despite the increasing proportion of the literature that has been made publicly available (Maggio, Moorhead, & Willinsky, 2017). Readers turning to the cancer research that newspapers cite, we have also found, encounter paywalls in the majority of cases (Maggio, Alperin, Moorhead, & Willinsky, 2017). Subscriptions, at whatever level, are preventing this research and scholarship from circulating and from being used by other scholars to the extent that it could, as has been demonstrated by a number of studies (Eysenbach, 2006; Hitchcock, 2013). The idea that research needs to be locked up for a year or two in order to extract the funding from the libraries to publish is a proposition that is being tested by initiatives, such as SCOAP₃, cited above.

The financial model for library-supported open access that follows uses the revenue and expense figures reported in a survey of Canadian journals conducted by Sibyl Frei and Louise Fleming in 2015 on behalf of a number of scholarly organizations (Frei & Fleming, 2016).⁶ The editors and staff of 69 journals provided financial data on their operations, with 56 (81%) of the journals in the social sciences and humanities and 13 (19%) in STM (sciences, technology, and medicine). As well, 15 (24%) of the journals provided immediate open access to their content, while among the remaining subscription titles, half of them offered readers delayed open access after a period of either 12 or 24 months (see Table 2).

Table 2: Annual average finances and content of Canadian subscription and open access journals in 2014

	Subscription journals (<i>n</i> = 54) ^a	Open access journals (<i>n</i> = 15)
Revenue	\$57,931	\$23,437
Expenses	\$51,859	\$22,067
Net income	\$6,072	\$1,370
Cost per article	\$1,852	\$1,226
No. of articles	28	18

Note: ^a In this and subsequent tables, not all survey participants provided data for all categories.

Source: S. Frei & L. Fleming, Survey Results – Shaping a Collective Future, *Datahub*, 2016

The discussion that follows employs the averages for the subscription and open access journals from the data provided. The averages are used to demonstrate how the collective model will work for, first of all, a typical subscription journal, and then, following that, for a collective of two (average) subscription journals and one (average) open access journal. The analysis does not presume that the averages from the Frei and Fleming data set are representative in any precise way of Canadian journals in general (the figures each journal provided, for example, were interpreted estimates for the categories requested). Rather, their survey forms a starting point for modelling the financing of open access on a cooperative basis.

Moving a subscription journal to open access

To mitigate the risk of moving to open access, this model could be said to have an initial condition that must be met before the process begins. The model assumes that a jour-

nal can only be expected to consider such a move when a sufficient number of libraries have agreed in advance to collectively replace the journal's current sales revenue (see Table 3). This is the amount that the journal will forgo with open access, as it will no longer sell access to its content, and in the case of the average subscription journal that amount is \$21,050. With a collection of libraries committed to making up that amount commitment, the subscription journal faces a revenue-neutral switch to open access.

Table 3: Annual average revenue for Canadian subscription and open access journals in 2014

Sales revenue sources	Subscription journals (<i>n</i> = 54)	Open access journals (<i>n</i> = 15)
Sales revenue	\$21,050	\$2,627
SSHRC grants	\$10,006	\$8,184
Other government grants	\$7,402	\$2,886
Other external grants	\$1,706	\$2,200
Internal institution grants	\$3,904	\$2,519
Institutional in-kind support	\$4,931	\$1,867
Association contribution	\$2,637	\$2,433
Other	\$6,295	\$2,433
Total Revenue	\$57,931	\$23,437

Source: S. Frei & L. Fleming, Survey Results – Shaping a Collective Future, *Datahub*, 2016

The starting point for assembling such a community of libraries to participate in this model would be the journal's current subscription list, including its international subscribers, while the recruitment of libraries will need to be part of a longer-range plan (considered below). In the Canadian context, with strong institutional support for the nation's scholarly communication, the average journal's sales amount to 36 per cent of the total revenue (Audley, 1994). The model proposed here is challenging the assumption that only by restricting access to the journal can this portion of its needed revenue be secured from the libraries.

The average subscription journal's sales revenue of \$21,050 involves not only subscriptions to its print and online editions, but, as well, aggregator royalties from sales to libraries; licensing fees, largely for student course-packs; and pay-per-view services for individual readers (see Table 4). It is worth noting that the data gathered by the open access journals in the Frei and Fleming survey suggests that aggregators and licensing agents are "selling" open access content, with open access journals receiving an average of \$2,627 in return. As the selling of open access content seems ill advised, if not unfair to those paying for such access, the total sales revenue would need to be replaced by the participating libraries. The interesting economic twist to this step—setting aside for the moment the value that aggregators provide libraries—is that as the model spreads to other journals, libraries should be able to reduce what they pay aggregators, much as students would pay less in course-pack licensing.

Table 4: Annual average journal sales revenue sources for subscription and open access journals in 2014

Sales revenue sources	Subscription journals (<i>n</i> = 54)	Open access journals (<i>n</i> = 15)
Print subscriptions	\$9,939	\$26
Online subscriptions	\$4,834	0
Copyright licensing	\$2,017	\$844
Pay-per-use sales	\$267	0
Aggregator online sales	\$3,441	\$1,357
Aggregator print sales	\$552	\$400
Total sales revenue	\$21,050	\$2,627

Source: S. Frei & L. Fleming, Survey Results – Shaping a Collective Future, *Datahub*, 2016

Now, I turn to the question of how many libraries might be expected or needed to join this collective and how much it would cost them to support this average subscription journal. Although Frei and Fleming did not collect information on subscription types, numbers, or rates, Lorimer and Lindsay (2004) found in their earlier study that Canadian journals averaged 561 subscribers (at an average institutional rate of \$74), with 175 foreign institutions (31%), 92 Canadian institutions (16%), 173 Canadian individuals (31%), and the rest unidentified. While mixing the results of two surveys is not a good practice, using the Lorimer and Lindsay figures, I can cautiously assume that if the 267 institutions that subscribed on average to Canadian journals in the 2004 survey were willing to subscribe to this open access model, it would cost each library \$79 to support the average subscription journal moving to open access without a loss of revenue. This \$79 figure points to how the move to open access can be structured to be not only revenue-neutral for a journal, but expense-neutral for participating libraries (given that, in this case, libraries were paying on average \$75 for institutional subscriptions in 2004).

As for the 173 individuals who subscribed, on average, to Canadian journals, according to the Lorimer and Lindsay 2004 survey, their contribution to the average journal's revenue is covered in this model by the libraries, which are matching the journal's entire sales revenue. However, another option is to ask these readers to subscribe to the journal's open access status at their lower individual rate (\$41), while still being able, if they wish, to pay for a print-on-demand copy of the journal. The Frei and Fleming survey data confirms a gradual decline in reader interest in print, however, and the move to open access might be a good point at which to outsource the print edition to a print-on-demand service.⁷ This will reduce the average journal's cost (or revenue needs) by \$8,585 (17%), while leaving open the option of enabling individual readers to still obtain a print edition at their own expense (see Table 5). The savings for the journal might be invested in editorial quality, used to reduce the library-cost ratio, and/or be allocated to build the journal's surplus and reserve.

Table 5. Annual average expenses for Canadian subscription and open access journals in 2014.

Journal expenses	Subscription journals (<i>n</i> = 54)	Open access journals (<i>n</i> = 15)
Salary	\$23,174 (45%)	\$11,795 (53%)
Copy preparation	\$6,256 (12%)	\$6,018 (27%)
Layout	\$4,448 (9%)	\$1,320 (6%)
Print-related expenses	\$8,585 (17%)	\$374 (2%)
Electronic publication fees	\$2,562 (5%)	\$1,885 (9%)
Tech assistance and training	\$502 (1%)	\$426 (2%)
Promotion	\$808 (2%)	\$247 (1%)
Other ^a	\$5,525 (11%)	\$29 (0%)
Total expenses	\$51,859 (100%)	\$22,067 (100%)

Note: ^a May include release time, salaries, or stipends for faculty

Source: S. Frei & L. Fleming, Survey Results – Shaping a Collective Future, *Datahub*, 2016

A second approach to building a collective of participating libraries is to turn to the Canadian Research Knowledge Network (CRKN), which is a partnership of 72 university libraries for negotiating access to scholarly publications, and as such, might take on the task of coordinating the move of Canadian subscription journals to open access. Using the figures presented here, each library would pay \$292 on average to support open access for each of the Canadian journals represented in this sample. And finally a third approach to the question of how many libraries would have to pay how much, we do have more recent data on the average subscription rate for the 60 subscription journals that both belong to the Canadian Association of Learned Journals (CALJ) and post their annual institutional subscription rates online, which was \$512 for online access in 2016. At that rate, it would take as few as 39 libraries paying this amount to the collective to cover the subscription revenue of the average Canadian subscription journal in this study to go open access without a loss of revenue.

Including existing open access journals in this collective model

While this article seeks to demonstrate how a cooperative approach between libraries and publishers can work in moving a subscription journal to open access, it is intended to be a viable publishing model for the broader Canadian scholarly publishing context. That is, the model will need to work for the full range of journals, including existing open access journals, so that all Canadian titles can share in the advantages of a sustainable open access model committed to maintaining and improving publishing quality. The inclusion of these open access titles in this collective model will augment the content offered by the collection of journals, while providing a sustainable basis for all Canadian journals felt to be publishing worthwhile content (i.e., without leaving behind early adopters of open access).

A function and advantage of this collective action in scholarly publishing is to advance standards for the editorial and production quality of the participating journals.

This includes the amount spent on a journal article for copy editing, layout, and management. It would seem reasonable to set a common standard for what are currently subscription and open access journals to invest on a per-article basis in the publishing process. Given the conversion of subscription journals as the starting point for this model, it makes sense to start with an outlay of \$1,537 per article, which is the average amount spent by subscription journals in 2014, based on the Frei and Fleming data and minus the 17 percent in printing expenses, as discussed above (see Table 2). This amount can then be used to consider the financial impact of introducing existing open access journals into the model.

Open access journals would bring their existing revenue into this collective organization (minus their current sales revenue, for reasons discussed above). In this study, open access journal revenue averages \$23,437 a year, with an average expenditure of \$1,226 per article (see Table 6). To bring the existing open access journal expenditures on its articles up to the standard of the average subscription journal (which is spending \$1,537 per article without printing), the collective will need to allocate \$311 per article to the average open access title, in addition to what that journal is currently spending on publishing.

Table 6. Annual budget for average subscription and open access journal pre- and post-collective (incorporating Table 2), based on 2014 figures.

	Pre-collective journals		Open access collective	
	Average subscription journal (ASJ)	Average open access journal (AOAJ)	2 ASJ	2 ASJ + 1 AOAJ
Journals	1	1	2	3
Articles	28	18	28 + 28	28 + 28 + 18
Sales revenue	\$21,050	\$2,267	N/A	N/A
Library allocation	N/A	N/A	\$42,100	\$42,100
Total revenue	\$57,931	\$23,437	\$115,862	\$136,299
Expenses	\$51,860	\$22,094	\$86,088 ^a	\$113,759
Net revenue	\$6,072 (10%)	\$1,370 (6%)	\$29,744 (26%)	\$22,540 (18%)
Cost/article	\$1,852	\$1,226	\$1,537	\$1,537

Note: ^a Subscription journal expenses are reduced by 17 percent in moving to the collective by shifting printing costs to a third-party print-on-demand service. *Source:* Frei & Fleming, 2016

The average open access journal would be allocated, on becoming part of this model, an amount of \$311 per article by drawing on the collective's net revenue, which in this instance is a robust 26 percent, with the two subscription journals, thereby reducing it to a still very healthy 18 percent for the three journals (if still falling short of the leading corporate scholarly publishers' net revenues; see Larivière, Haustein, & Mongeon, 2015). This allocation ensures that the libraries would not need to contribute any further funding to support open access journals joining the collective, as long as

only one open access journal is admitted to the collective for every two subscription journals. This will maintain the starting principle that this open access model can be revenue-neutral for journals and expense-neutral for libraries.

As for the way in which this model could be organized, participants may decide to legally incorporate into a multi-stakeholder cooperative, or they may agree to operate through some form of contractual arrangements, or they may rely on the memorandums of understanding that are common enough among institutions. The setting of journal membership criteria in the collective will be a major governance consideration, reflecting assessments of article quality, journal organization, and procedures, readership, and impact (with consideration given to the relative sizes of fields and topics, as well as principles of academic freedom). These criteria will need to allow for both dropping journals and incubating innovative new journals for a trial period. It may make sense during the initial contract period for participants to join the collective for multiple years, to further mitigate the publisher risk and to seek additional support from an agency such as SSHRC to support the transition period. A key consideration here is that the large corporate publishers typically offer societies five-year agreements, which include contingency clauses that provide the assurances needed on both sides. Such an agreement could also include terms under which the libraries would support the journal giving up open access and reverting to the sale by subscription of exclusive access to its content.

Limitations of the study

This analysis is based on the Frei and Fleming survey sample of 69 Canadian journals conducted in 2014. Any sample is bound to be inadequate in predicting what a given set of Canadian journals and libraries might face in considering the formation of such an entity. Those interested and intrigued by the possibilities can begin with their own figures, given that one advantage—and initial challenge—of this cooperative approach will be learning to work with a more transparent publishing economy. It will involve a process of deliberation, planning, calculation, and application that will not end. The actual article allocation for any given set of journals participating in this model, for example, would have to be decided on an ongoing basis by the participating journals and libraries, although with a similar eye, or it is hoped, on improving journal quality on a sustainable basis.

Also of note, although this study works with the averages from the survey, the collective's allocations to the participating journals will be based on their current budgets. While finances will differ for historical reasons, the collective is likely to have a long-term interest in adjusting the allocations to journals to reflect differences in expenses related to the number of submissions and articles published, the preparation of tables and figures, the length and nature of the articles (including the languages used), and other factors. At the same time, establishing a baseline for editorial expenses seems like a good starting principle for the collective to consider as part of its commitment to the quality of scholarly publishing. The model's financial openness, as well as its commitment to quality, should assist in recruiting and retaining the support of libraries.

While better financed subscription journals may be tempted to seek direct library support for their individual conversion to open access, rather than joining with other

journals, the collective will offer libraries the advantage of a well-managed bundle of journals with some thematic coherence, as suggested by the concentration of Canadian social sciences and humanities, reducing the recruitment overhead for journals and libraries. The collective action of journals and libraries will also make it somewhat more difficult, but not impossible, for some libraries to get a free ride on the resulting open access by not joining the collective. A further check on free riding, apart from the pressure of peer libraries that have joined the collective, is the prospect that without sufficient library support for the collective, the journals will simply continue with their subscriptions.

Still, the collective will need to address the free rider issue through active retention and recruitment measures by both member journals and libraries, as well as ongoing demonstrations of collective value, including the value of cooperation (e.g., by crediting libraries for in-kind contributions). Both of these aspects will be important in assessing the health of the collective, and worth devoting a portion of the net revenue to, along with investing in publishing innovations and building a reserve (as noted above). As part of this assessment process, the model will need to establish the extent of reader and author use of its journals, using standard library measures of readership, citation records, and article-level metrics, in order to track both academic and public use and impact of this published work.

Conclusion

This article has set out how a subscription journal can be converted to open access by building on the cooperative spirit that libraries have been exhibiting for some time in their support for open access, as well as on the principles of collaboration that underwrite much of the publishing enterprise among authors, editors, and reviewers. It is intended to demonstrate the different ways in which current journal revenue and library expense levels can be preserved, at least as a starting point. It offers an example of how this scholarly publishing economy can be reconfigured to realize greater access to Canada's research and scholarship. But then the value of any proposal, at this point, is that it may serve as a further provocation for developing what will prove to be better, more compelling models, as well as serving, one hopes, as a prompt for more extensive sharing of the publishing data needed to develop such models. These are all necessary steps in building the trust and interest needed to work out more of the details and to pilot new models that will help move more if not all of this country's scholarly publishing into a state of well-supported open access, in recognition of its standing as a public good.

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Notes

1. The publishing analyst company Outsell reports that “funders will not fully support APCs at their current levels ... The lack of uptake of funding APCs will continue if APCs charged by traditional publishers, which make up the majority of the top players, remain at their current levels” (Open Access 2015, p. 8). On the other hand, the rapid growth of PLOS One and other APC-based mega-journals suggests that many researchers in the sciences are not averse to paying such fees.
2. In the interests of full disclosure, I direct the Public Knowledge Project at Simon Fraser University Library, which is the developer of the open source (free) software Open Journal Systems.
3. The count does not include 48 student journals hosted by these libraries, nor 14 of the journals for which it was not clear that the journal had begun publishing beyond an initial issue. The count may include journals that have ceased publication, but which are continuing to provide multiple issues’ worth of content with the support of the library’s Web hosting.
4. The University of Alberta Libraries provide a “no-fee” service to any “Canadian fully open access journal,” with this service agreement involving a memorandum of understanding that states the library’s commitment to providing free hosting service, routine maintenance, and the latest version of Open Journal Systems software. All but one of the libraries hosting the journals in Table 1 employ Open Journal Systems for the management and publishing of the journals. Western University uses Bepress, and the University of New Brunswick supplements OJS with WordPress. According to the Journal Citation Reports, in 2014, the *Canadian Journal of Sociology* had an impact factor (average number of citations per article over a two-year period) of 0.500 compared to 0.412 in 2007, its final year in print (although it had an earlier high of 0.700 in 2006).
5. The Frei and Fleming study (2016) was conducted on behalf of Consortium Érudit, the Canadian Association of Learned Journals, the Federation for the Humanities and Social Sciences, Canadian Science Publishing, and the Social Sciences and Humanities Research Council (see Paquin, 2016). The data for the Frei and Fleming survey is available on Datahub: <https://datahub.io/dataset/survey-results-shaping-a-collective-future>.
6. Among those who participated in the Frei and Fleming survey (2016), 13 percent reported an increase in online subscriptions, compared to 3 percent reporting a decline over the previous three years; on the other hand, 14 percent of the participants reported a decline in print subscriptions, compared to 7 percent reporting an increase.
7. Print-on-demand services for open access content are provided by a number of open access monograph publishers to subsidize their open access operations, and this option could be maintained with these journals over what appears to be a slowly declining interest in print (Kwan, 2010).

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