Sustainability of Open Access journals: a short review

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Abstract: *This short review starts with a description of types of Open Access journals according to their financial management. Their funding sources could be internal -generated by the publisher or journal activity- or external –not generated by them. Internal types of funding are APCs, community publishing, off-print sales, publicity, sponsorship, and others. The external sources are membership fees, member schemes, public funding, collaborative purchasing models and discounts through institutional subscriptions. APCs are present on 75% of the embargoed OA journals, while only 25% in full-OA titles; they are paid in the 90% of the cases by authors sponsors, not by authors themselves. OA publishing model is cheaper than the classical subscription-based model.*

Some factors regarding the most important sources for revenue for OA journals are mentioned, according to previous deep studies. A business model is composed by three dimensions –economic, operative and strategic-, and the success and viability of the journal depends on the diversification of the revenue sources.

Finally, some conclusions are given.

Keywords: Open Access, scholarly communication, scientific publication, scientific journals, sustainability, economic aspects

Types of journals

There are different types of journals according to their degree of free access: free, free with embargoes or pay-walls, hybrid –some articles are OA, some are not- or restricted to subscribers.

Harnad (2013) has recently wrote that *"Gold OA journals may cover their costs in one of several ways"*, mentioning four different types of journals: "subscription", "subsidized", "volunteer" and "hybrid" journals. This classification is useful but then a deeper approach is needed.

Types of funding

In 2002, the Budapest OA Initiative set some sources and mechanisms for obtaining funding. Ten years later, its recommendations[1] stated that universities and research centers should help authors paying APCs and fund no-fee OA journals. A number of deep studies of costs and incomes have been published over the last years: Crow & Goldstein (2003), Crow (2009), Abadal (2012), Villarroya, Claudio-González, Abadal, & Melero (2012), Swan (2012, sec. 5. Business models) and Suber (2012, sec. 7. Economics). After reviewing those, a detailed classification is offered here:

Internal (generated by the publisher or journal activity)

- APCs. The cost depends on the type of journal, the subject field, and other aspects. According to Abadal (2012), it can be from €600 to €1,200, while Outsell estimated that the average was $660 in 2011 (Ricci & Kreisman, 2013). For example, publishing in PLoS journals costs from $1,350 to $2,900[2], and the price for SpringerOpen is from $800 to $1,200 (Navas-Fernández, 2013). Another example is

[1] http://www.budapestopenaccessinitiative.org/boai-10-recommendations (section 3. On infrastructure and sustainability)
[2] http://www.plos.org/publish/pricing-policy/publication-fees/

PeerJ, where prices are conducted by "plans" -it could cost from $99 to $299, depending on the number of times that the author will be allowed to publish ($299 is for a life-time)[3].

It is important to say that the authors do not always pay APCs for their articles from their own pocket, because their sponsors (universities, research centers, etc.) do that, or they are covered by a grant or a library budget. According to Suber (2012, sec. Economics), 70% of OA journals without embargos do not charge APCs, and only in 12% of the remaining 30% authors end up paying. In contrast, 75% of OA journals with toll-access do charge it. In the end, almost 90% of the cases that the fee is required, the payment is done by sponsors, not by the authors themselves. One could appreciate in the following figures how APCs proportion turns almost 180º from full OA (no embargo) to delayed OA journals (embargo):

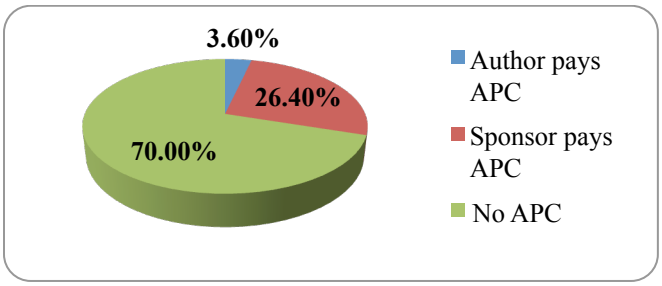

Figure 1. Not embargoed journals

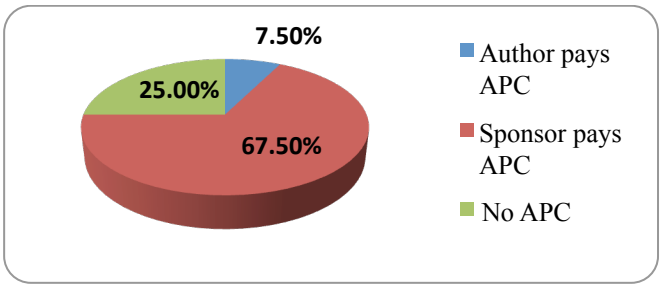

Figure 2. Embargoed journals

Figure 3 has been realized collecting data from DOAJ[4]. Please note that no hybrid or embargoed journals are included in these almost ten thousand journals, as said before. Conditional payment refers to the payment that some authors have to provide if a style or language correction is needed.

Thus, two thirds of the open access journals do not charge APC, and less than one third does. It matches Suber's data regarding journals without embargoes.

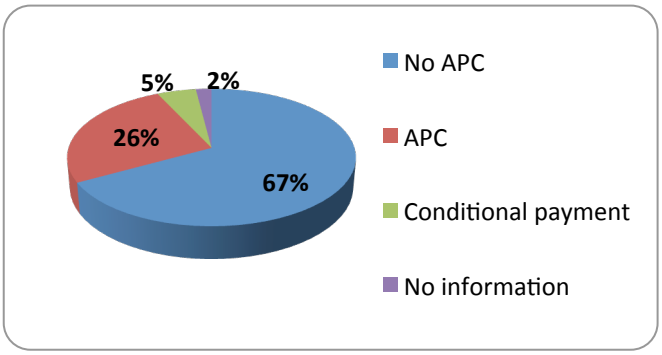

Figure 3. Payments in DOAJ journals

- Community publishing. *"This is a model under which journals are produced entirely within the academy as a result of voluntary efforts by researchers who provide editing, peer review and production services"* (Swan, 2012, sec. 5. Business models). They are common in the field of humanities. This is related to the so-called Platinum OA, where neither the reader nor the author pays.
- Off print sales
- Publicity: introducing advertising from private companies in the journal[5]. It's becoming more and more common, but money obtained from that is still very little.
- Sponsorship: the journal can be sponsored by a public body[6].

[3] https://peerj.com/pricing/

[4] http://www.doaj.org/doaj?func=byPublicationFee&uiLanguage=en [10 December 2013]. At that moment, the population was 9979 journals. Please note that this URL is not valid at least from January 2014, because DOAJ web migrated.

[5] For instance, British Medical Journal (http://www.bmj.com/), *"a prime vehicle for job advertisements in the UK medical arena"* (Swan, 2012, sec. 5. Business models)

- Organizing events with scientific societies
- Sells to aggregators or information distributors
- Service and product selling: benefits for printing, special editions, etc.

External (not generated by the publisher or journal activity)
- Membership fees: typically in scientific societies.
- Institutional member schemes: a kind of institutional subscription for paying charges for their authors' articles, typically in humanities[7].
- Public funding: by universities, research centers, government departments… This is usually related to social sciences and humanities journals.

There are policies and mandates issued by governments – they fund research and therefore they can ask for requirements for the publications that come out from that research. Alma Swan wrote that requirement from mandatory policies *"cannot, for obvious reasons, be that an author publishes in an OA journal. There may be costs involved that the author cannot meet…"* (Swan, 2009). Today, it is true that policies and mandates consider repositories above all, but there are some that take into account funding or reimbursing authors for publishing in OA journals[8].
- Users' consortia or collaborative purchasing models[9]: groups of users or libraries interested in the same journals join together in order to obtain funding which will pay publishers for making these available OA, with no cost for the authors either. It means re-directing money from subscriptions payment to APCs payment[10].
- Discounts through institutional subscriptions. It applies to libraries and institutions that have large subscriptions with some editorials, which, in return, offer important discounts for their authors to publish in their journals.

OA vs. subscription-based model

What is best for publishers, the OA model or the subscription-based model? According to a recent article in Nature (Van Noorden, 2013), the costs of OA publishing model ($2,289) are lower that online subscription ($3,509), and even cheaper than the print subscription plus online access model ($4,871). This break down is due to the cuts of typesetting and printing, and the simplification of sales administration and user management[11].

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[6] For example, the platform Scielo (http://www.scielo.br) is sponsored and supported by the Foundation for Research Support of the State of Sao Paolo (FAPESP).

[7] For example BioMedCentral (http://www.biomedcentral.com/libraries)

[8] The European Commission, within the Seventh Framework Programme (FP7) and the 2020 Horizon (the EU's Research & Innovation funding program for 2014–2020) has been introducing some measures to improve access to scientific information produced in Europe (http://ec.europa.eu/research/science-society/index.cfm?fuseaction=public.topic&id=1294&lang=1). Thus, all articles published with funding from Horizon 2020 program must be accessible online -either at journals or repositories- from 2014 onwards. The publication costs will be eligible for reimbursement by the EC.
In the UK, the Research Councils (RCUK) issued a mandate requiring the publishing in Open Access from April 1st 2013 of all articles and communications coming from researches funded by one of their members (RCUK, 2012). That mandate included the funding for APC payments.

[9] Swan calls it *"collaborative purchasing models"* (Swan, 2012, sec. 5. Business models)

[10] The paradigmatic example is SCOAP[3] (http://scoap3.org/). It is an initiative promoted and managed by CERN in Geneva, Switzerland. APCs are not paid by authors, but centrally from a common fund to which libraries, library consortia, research institutions and funding agencies jointly contribute. Countries participating have contributed according to their scientific output, and libraries involved will obtain reductions in subscription prices to the "liberated" journals. The project will start its operation on 1st January 2014, as recently announced.

[11] The original study was carried out by Houghton et al. (2009)

What does an article cost? The study by Houghton et al. (2009) stated that the costs for an editor were as follows in Table 2.

They also found that the global cost per digital article was £ 8,296 for subscription, £ 7,486 for Gold OA and £ 7,115 for Green OA. Therefore, it is pretty clear that costs of OA publishing are lower than subscription-based.

Table 2. Costs for OA journals (2007, UK)

	Subscription	Open Access
Print only	£2,728	£1,831
Print / digital	£3,247	£2,003
Digital only	£2,337	£1,524

Business models

The Association of Learned and Professional Society Publishers issued a report (Kaufman-Wills Group, 2005), collecting information of journals published by a few American publishers -including themselves- and DOAJ. There were subscription-based and OA journals, both for-profit and not-for-profit. Regarding the DOAJ ones, the most important sources of revenue were displaying advertising (56.9%), volunteers (56%), in-kind contributions (39.9%), licensing content for third-parties (30%), corporate sponsorships (31%), commercial reprints (27.4%) and classified advertising (27%). Grants were just about 11% (both governmental and internal institutional), just as important as print version subscription (11% too).

Chang (2006) studied three big publishers (BioMed Central, PLoS and Medknow), and found that there were four major success factors for the sustainability of Open Access publishing: saving in publication costs, increase of revenue, adoption of innovative technology, and quality control.

In more recent works, and from an economic point of view, a business model is something more complex than just a balance between costs and incomes. Villarroya et al., (2012) described in their article that a business model for an OA journal has to consider three dimensions: economic-financial, operative and strategic.

Table 3: Business model composition

Business model		
Economic dimension	**Operative** dimension	**Strategic** dimension
- Incomes amount and composition	- Organizational structure	- Vision, mission, values
- Costs amount and structure	- Production processes and service providing	- Identification and relationship with stakeholders
		- Product differentiation
- Operative profits	- Distribution	- Market segmentation
	- Logistics	- Alliances, networking

These three dimensions have to be treated separately in order to obtain success. According to the previous authors, *"Open Access journals have to diversify their revenue sources to be sustainable"*.

Conclusions

Not only is gold OA here to stay, but perhaps even to become the main publishing model for scientific journals. OA articles may be overcoming 40% of the total (European Commission, 2013), and costs

related to them are lower than the traditional subscription-based model. Therefore, publishers may consider it when launching new journals. Those still in subscription or pay-per-access models, can be converted little by little in OA – hybrid models can be a good beginning.

Editors must consider the three dimensions defined by Villarroya et al., (2012) for a business model, and sources of revenue should diversify in order to achieve sustainability. This may apply to commercial or non-profit goals.

It is quite revealing, though not new, that those for-profit OA are more focused in short-term and commercial impact subjects (life and health sciences, physics, etc.), while those not-for-profit OA use to work in social sciences and humanities fields. The reason is that the first ones are more suitable for producing benefits than the second. Thus, commercial publishers are sustained by their own benefits (usually coming from APCs), while non-commercial are supported by grants from public-funded bodies.

According to Suber's data on APCs payments (2012), embargoes mean payment of APC in 75% of the cases, while full-OA does not require them in a similar percentage. This fact establishes a clear relationship between embargoes and APCs. Nevertheless, authors only pay them in 10% of the cases.

There is not a better funding or model for Gold OA. To illustrate that opinion, Heather Joseph (Executive Director of SPARC) said *"if we have learned anything in the Open Access movement, it's that not all scientific communities are created the same: one size doesn't fit all"* (Van Noorden, 2013). Indeed, Peter Suber had written *"no one claims that one size fits all"* (Suber, 2012, p. 137).

The Finch Report (Finch, 2012) has clearly gone for Gold OA and the author-pays model in the UK, dismissing repositories and justifying embargoes. This could be valid for UK, USA and other western and rich countries, due to their scientific publication infrastructure and consolidated public grants, but not for other parts of the world. Thus, the "own funding" (the so-called "Platinum road" or "community publishing") may be more suitable for other regions as Southern Europe, Latin America and emerging countries. For instance, Brazil *"has a fully open access distribution model (97%) with few journals requiring payment by authors, due to cultural, financial, operational and technological support provided by public agencies"* (Abadal & Rodrigues, 2014). This may prove that Gold OA could be absolutely valid according to the Budapest Initiative spirit.

The majority of studies, policies and mandates are based in UK, USA or by the European Commission. It would be interesting to have others at a national level and from other latitudes of the world as well.

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