

The Oligopoly's Shift to Open Access Publishing: How For-Profit Publishers Benefit from Gold and Hybrid Article Processing Charges

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Abstract or Résumé:

This study estimates fees paid for gold and hybrid open access articles in journals published by the oligopoly of academic publishers, which acknowledge funding from the Canadian Tri-Agency. It employs bibliometric methods using data from Web of Science, Unpaywall, open datasets of article processing charges list prices as well as historical fees retrieved via the Internet Archive Wayback Machine for journals published by Elsevier, Springer-Nature, Wiley, Sage and Taylor & Francis to estimate article processing charges for open access articles published between 2015 and 2018 that acknowledge funding from the Canadian Federal funding agencies CIHR, NSERC, and SSHRC, as well as grants jointly administered by the Tri-Agency. During the four-year period analyzed, a total of 6,892 gold and 4,097 hybrid articles that acknowledge Tri-Agency funding were identified, for which the total list prices amount to \$US 27.6 million.

1. Introduction

While the growth in open access (OA) (Piwowar et al., 2018) in recent years is a positive development towards making research more accessible, the OA landscape is complex and fraught by the academic publishing market, a profitable business controlled by an oligopoly of academic

publishers, which consists of a few for-profit companies (Elsevier, SAGE, Springer Nature, Taylor & Francis, and Wiley). Since the beginning of the digital era, these companies have acquired small publishers and now control the majority of scholarly journal publishing (Larivière et al., 2015), generating profit margins as high as 37% (Aspesi et al., 2019). These profits stem largely from subscription fees and article processing charges (APCs) paid by the academic community to read and publish content provided for free by that same community. The oligopoly's dominant approach to OA focuses on the author-pays model and often involves astronomical article processing charges (APCs) that create inequities and barriers that excludes many from publishing (Asai, 2020; Demeter, 2020).

Early OA manifestos – Budapest Open Access Initiative (2002), the Bethesda Statement on Open Access Publishing OA and the Berlin Declaration on Open Access to Knowledge in the Sciences and the Humanities (2003) – advanced the argument for the right to free, unrestricted and barrier-free access to publicly-funded research and birthed the early beginnings of funder OA policies. In Canada, the Tri-Agency Open Access (OA) Policy on Publications mandates since 2015 that all funded research for grantees of the Canadian Institutes of Health Research (CIHR), Natural Sciences and Engineering Research Council (NSERC), and Social Sciences and Humanities Research Council (SSHRC) be made available as OA (I. Government of Canada, n.d.).

The Tri-Agency OA Policy on Publications stipulates that grant holders publish their research as OA through two routes: in an online repository (green route, which can follow a 12-month embargo) or in a journal that offers immediate OA (hybrid or gold). To comply, many researchers choose the second route and often pay APCs. Even if authors can use grant funds to cover these costs – as the Tri-Agency policy allows – it is alarming to see the rate at which resources intended to support research—often taxpayer money—leave academia to maximize shareholder profits (Government of Canada, 2019). The author-pay-models commodifies knowledge, privileging the profits of large publishers over the equitable participation of all players in the scientific enterprise. This approach counters the BOAI 2022 recommendations to move away from the APC model to favour more inclusive forms of publishing that support an equitable and sustainable model for research (*BOAI20*, n.d.).

Although the majority of gold OA journals does not require authors to pay (73% of journals indexed in the DOAJ have no APCs), high APCs are common from prestigious publishers (Khoo, 2019; Siler & Frenken, 2020). For gold OA journals that do rely on APCs, previous studies estimate the average fees to be \$1,800 (Jahn & Tullney, 2016; Solomon & Björk, 2016). Counterintuitively, hybrid APCs—subscription journals where individual articles are made freely available through APCs—are significantly more expensive (Pinfield et al., 2016, Matthias, 2018), with average estimates of \$2,900 (Jahn & Tullney, 2016; Solomon & Björk, 2016). The main criticisms of hybrid OA are the high price point with APCs and the potential for publishers to double-dip—the practice of receiving two different sources of revenue for the same article (Eve, 2014; Matthias, 2018; Pinfield et al., 2016; Suber, 2012).

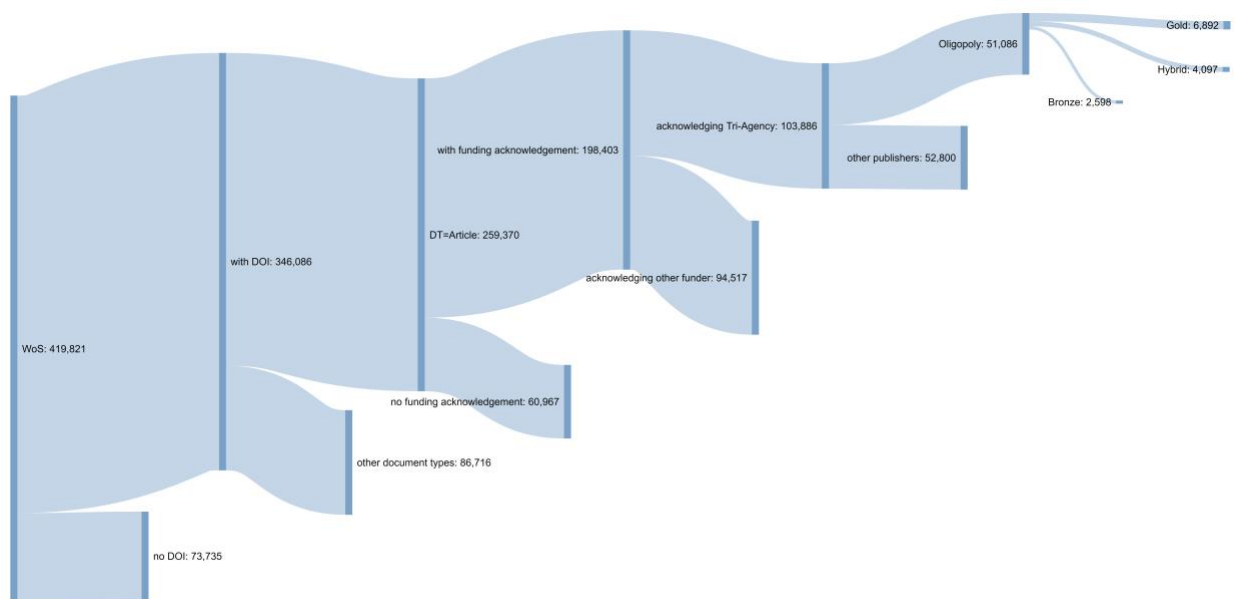
This study aims to estimate the total amount (\$US) of APCs for gold and hybrid OA articles published between 2015 and 2018 that acknowledge funding from the Canadian Tri-Agency, in journals controlled by oligopoly publishers.

2. Methods

This study combines data from Web of Science (WoS) and Unpaywall with open datasets of APC list prices (Matthias, 2020; Morrison et al., 2021), as well as historical APC fees manually retrieved via the Internet Archive Wayback Machine. Peer-reviewed journal articles published by one of the oligopoly publishers between 2015 and 2018 were identified using WoS, with imprints and/or subsidiary publishing companies manually assigned to the parent oligopoly company. Document types were restricted to articles as these include original research findings and excludes document types (e.g., editorial material, reviews) that might be exempt from APCs. Publications were further restricted to include only those with a Digital Object Identifier (DOI) to retrieve their access status via Unpaywall. In order to identify articles that fall under the Tri-Agency OA Policy, we queried the funding acknowledgements in WoS for mentions of CIHR, NSERC, SSHRC and other major Tri-Agency programs. Since there is no standardized format to acknowledge a funding agency, variations of acknowledgements were tagged to a single entity: CIHR, NSERC, SSHRC, or an addition category titled “Tri-Agency” for those grants jointly administered by the three agencies.

The April 2020 snapshot of the Unpaywall.org database was used to obtain the OA status (gold, hybrid, bronze, green, closed) for each DOI in our dataset. This study focuses on hybrid and gold articles, as they are the ones potentially associated with APCs. Annual APC list prices were determined for any journal that had at least one gold or hybrid article based on the WoS-Unpaywall dataset. For the majority of oligopoly journals, APCs were derived from an open dataset (Matthias, 2020), which include annual APCs in \$US for Elsevier, SAGE, Springer Nature, Taylor & Francis, and Wiley journals. APC data was verified for completeness and several steps were taken to fill remaining gaps, including an extensive manual search of archived publisher’s webpages on the Internet Wayback Machine. Data that could not be obtained from Matthias (2020) or the Wayback Machine was obtained from APCs collected by Morrison et al. (2021). Remaining gaps were filled by applying the fees from the closest year of existing APC data or current (2021/2022) prices.

Figure 1: Sankey diagram of gold and hybrid Canadian oligopoly articles acknowledging Tri-Agency funding in WoS 2015-2018



3. Preliminary results

For articles indexed in WoS between 2015 and 2018, we estimate a total of \$27.6 million for gold and hybrid APCs for OA articles that acknowledge at least one Tri-Agency funder (CIHR, NSERC, SSHRC) or grant program, and are published in oligopoly journals (Figure 1). Overall, authors who acknowledge CIHR and NSERC paid a similar amount for 2015-2018 with an estimated \$15.0 million and \$14.2 respectively. On the other hand, articles that acknowledge SSHRC funding pay a much lower amount in APCs than the other two funders, with an estimated \$0.8 million in APCs for gold and hybrid articles. Authors who acknowledged grants jointly administered by the Tri-Agencies (i.e. Canada Research Chairs, Networks of Centres of Excellence of Canada) paid an estimated \$4.9 million for gold and hybrid APCs for OA articles in oligopoly journals.

For all oligopoly publishers, annual APC amounts for gold and hybrid articles that acknowledge Tri-Agency funding increased between 2015-2017, but slightly decreased from 2017 to 2018 (Figure 2). Comparing publishers, we estimate that for any OA article (gold or hybrid) that acknowledges a Tri-Agency funder or grant, Springer-Nature obtained \$US 13.0 million, Elsevier \$US 9.9 million, Wiley \$US 3.4 million, Taylor & Francis \$US 0.8 million and Sage \$US 0.4 million in. APCs for articles published in WoS-indexed journals during the 4-year period analyzed.

Figure 1: Total amount of APCs (gold & hybrid) per oligopoly publisher, for articles that acknowledge a Tri-Agency funder or grant

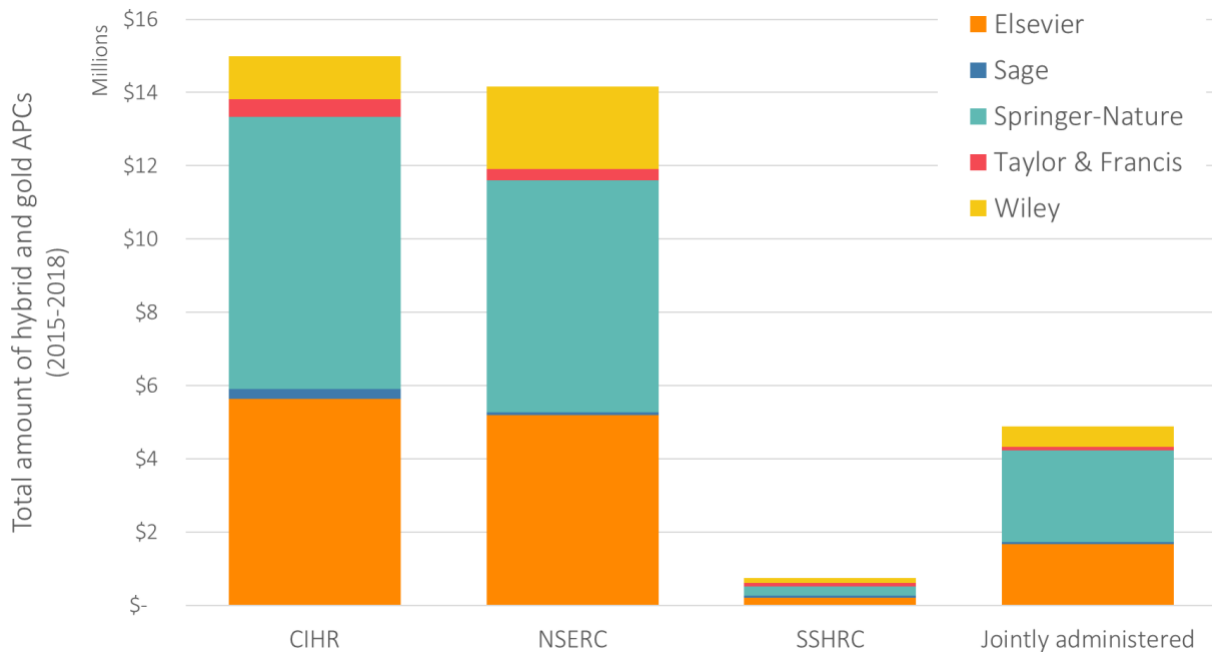
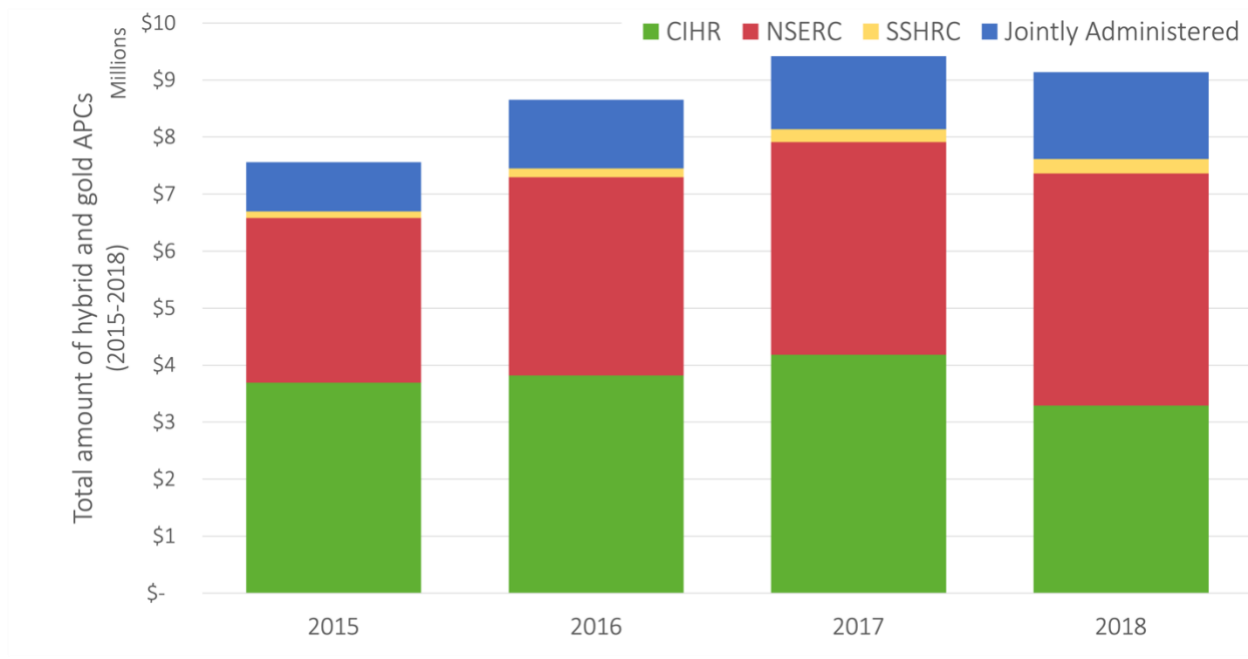


Figure 2: Total amount of APCs (gold & hybrid) per year (2015 – 2018) for articles that acknowledge a Tri-Agency funder or grant published by the oligopoly



Discussion

The oligopoly's revenues from gold and hybrid APCs continue to increase, demonstrating a strong source of profits at the cost of authors and funders, and like previous studies demonstrate, their control of the scholarly publishing market (Larivière et al., 2015). Instead of making scholarly publishing sustainable and accessible for all, exorbitant APCs (and more recently transformative agreements) preserve the status quo of the academic publishing market. The author-pays model excludes large parts of the academic community from publishing, giving preference to well-funded authors and institutions, those at a later career stage, disciplines, countries, and excludes marginalized communities (Chan et al., 2020; Olejniczak & Wilson, 2020). Instead of removing barriers from academic publishing, OA APCs have shifted inequities from readers to authors, often affecting those same individuals (Simard et al., 2021). Our results demonstrate that although there is growth in OA, the dominant publishing system perpetuates existing capital and class systems at the cost of the public, whose tax dollars fund the profits of the oligopoly of publishers.

References

- Asai, S. (2020). Market power of publishers in setting article processing charges for open access journals. *Scientometrics*, 123(2), 1037–1049. <https://doi.org/10.1007/s11192-020-03402-y>
- Aspesi, C., Allen, N. S., Crow, R., Daugherty, S., Joseph, H., McArthur, J. T. W., & Shockey, N. (2019). *SPARC Landscape Analysis: The Changing Academic Publishing Industry* –

- Implications for Academic Institutions* [Preprint]. LIS Scholarship Archive.
<https://doi.org/10.31229/osf.io/58yhb>
- Chan, L., Hall, B., Piron, F., Tandon, R., & Williams, W. L. (2020). *Open Science Beyond Open Access: For and with communities, A step towards the decolonization of knowledge*.
<https://doi.org/10.5281/zenodo.3946773>
- Demeter, M. (2020). *Academic knowledge production and the global south: Questioning inequality and under-representation*. Palgrave Macmillan.
- Eve, M. P. (2014). *Open Access and the Humanities: Contexts, Controversies and the Future*. Cambridge University Press. <https://doi.org/10.1017/CBO9781316161012>
- Government of Canada, I. (n.d.). *Tri-Agency Open Access Policy on Publications—Science.gc.ca*. Innovation, Science and Economic Development Canada. Retrieved May 15, 2021, from https://www.ic.gc.ca/eic/site/063.nsf/eng/h_F6765465.html
- Government of Canada, N. S. and E. R. C. of C. (2019, December 18). *NSERC - Inter-Agency, Tri-Agency Financial Administration*. https://www.nserc-crsng.gc.ca/InterAgency-Interorganismes/TAFA-AFTO/index_eng.asp
- Jahn, N., & Tullney, M. (2016). A study of institutional spending on open access publication fees in Germany. *PeerJ*, 4, e2323. <https://doi.org/10.7717/peerj.2323>
- Khoo, S. Y.-S. (2019). Article Processing Charge Hyperinflation and Price Insensitivity: An Open Access Sequel to the Serials Crisis. *LIBER Quarterly*, 29(1), 1.
<https://doi.org/10.18352/lq.10280>
- Larivière, V., Haustein, S., & Mongeon, P. (2015). The Oligopoly of Academic Publishers in the Digital Era. *PLOS ONE*, 10(6), e0127502. <https://doi.org/10.1371/journal.pone.0127502>
- Matthias, L. (2018). *The worst of both worlds: Hybrid Open Access*. OpenAIRE.
<https://www.openaire.eu/blogs/the-worst-of-both-worlds-hybrid-open-access>
- Matthias, L. (2020). *Publisher OA Portfolios 2.0 (Version 2.0)*. Zenodo. doi: 10.5281/zenodo.3841568
- Morrison, H. (2021). *2011—2021 OA APCs* (V1 ed.). Scholars Portal Dataverse.
<https://doi.org/10.5683/SP2/84PNSG>
- Olejniczak, A. J., & Wilson, M. J. (2020). Who’s writing open access (OA) articles? Characteristics of OA authors at Ph.D.-granting institutions in the United States. *Quantitative Science Studies*, 1(4), 1429–1450. https://doi.org/10.1162/qss_a_00091
- Pinfield, S., Salter, J., & Bath, P. A. (2016). The “total cost of publication” in a hybrid open-access environment: Institutional approaches to funding journal article-processing charges in combination with subscriptions. *Journal of the Association for Information Science and Technology*, 67(7), 1751–1766. <https://doi.org/10.1002/asi.23446>
- Piwovar, H., Priem, J., Larivière, V., Alperin, J. P., Matthias, L., Norlander, B., Farley, A., West, J., & Haustein, S. (2018). The state of OA: A large-scale analysis of the prevalence and impact of Open Access articles. *PeerJ*, 6, e4375. <https://doi.org/10.7717/peerj.4375>
- Siler, K., & Frenken, K. (2020). The pricing of open access journals: Diverse niches and sources of value in academic publishing. *Quantitative Science Studies*, 1(1), 28–59.
https://doi.org/10.1162/qss_a_00016
- Simard, M. A., Asubiaro, T., & Mongeon, P. (2021, May). The burden of article processing charges on Canadian universities. *Proceedings of the Annual Conference of CAIS/Actes Du Congrès Annuel de l’ACSI*.

- Solomon, D., & Björk, B.-C. (2016). Article processing charges for open access publication—
The situation for research intensive universities in the USA and Canada. *PeerJ*, 4, e2264.
<https://doi.org/10.7717/peerj.2264>
- Suber, P. (2012). *Open access*. <http://site.ebrary.com/id/10571237>