Check for updates

ORIGINAL ARTICLE

LEARNED PUBLISHING

(wileyonlinelibrary.com) doi: 10.1002/leap.1611 Received: 8 January 2024 | Accepted: 25 April 2024 | Published online in Wiley Online Library: 17 May 2024

The road to sustainability: Examining key drivers in open access diamond journal publishing

JungWon Yoon [1], Halin Ku,[2] and EunKyung Chung [3]*

[1]Department of Library and Information Science, Jeonbuk National University, Jeonju-si, South Korea

[2]Department of Sociology, Seoul National University, Seoul, South Korea

[3]Department of Library and Information Science, Ewha Womans University, Seoul, South Korea

ORCID:
J. Yoon: 0000-0003-2579-7688
E. Chung: 0000-0001-9896-8623

*Corresponding author: EunKyung Chung, Ewha-POSCO Building (Social Sciences) #418, 52, Ewhayeodae-gil, Seodaemun-gu, Seoul 03760, Republic of Korea.
E-mail: echung@ewha.ac.kr

Abstract: Despite the rising interest in open access (OA) diamond journals as a scholarly journal publishing model, their sustainability remains a pressing concern. Using the Open Access Diamond Journals Study (OADJS) Dataset, we examined the characteristics and factors of OA diamond journal publishing that are associated with high sustainability. From 1335 journals, 476 journals with low sustainability and 438 journals with high sustainability were selected and compared. Our analysis revealed that factors such as the region and official language of the publishing country and the discipline, ownership, and financial status of the journal were significantly associated with sustainability. Journals owned by government or national agencies, those with financial stability, and those promoting open practices like unrestricted text and data mining are more likely to be sustainable. This study also discusses the implications of these findings for the future of scholarly publishing and the open science movement. Ultimately, we emphasize the need for national and international support to enhance the sustainability of OA diamond journals and propose that a collective approach involving policymakers, funding agencies, and journal administrators is crucial for fostering a sustainable open access ecosystem.

Keywords: open access, open access diamond journal, sustainability

INTRODUCTION

Open science aims to make research results, data, and methods freely available to everyone, including researchers, policymakers, and the general public. Open science is implemented through various means, such as open access (OA) publishing, open data, and open peer review, which can lead to the increased accessibility, transparency, and reproducibility of science research (UNESCO, 2021). In other words, open science addresses issues of knowledge disparity as well as ensures the quality and integrity of scientific research.

Among open science practices, OA journal publishing aims to make scholarly research outputs available to anyone with an internet connection without requiring payment or subscriptions. OA journal publishing has received attention as a response to the rapid increase in journal subscription fees that has led to researchers facing paywalls and limited their access to scholarly journals. Particularly, OA journal publishing is considered beneficial to researchers in economically disadvantaged countries and, consequently, can reduce knowledge disparity in global scholarly communication (IFLA, 2022; Powell et al., 2020).

© 2024 The Authors. *Learned Publishing* published by John Wiley & Sons Ltd on behalf of ALPSP.
This is an open access article under the terms of the Creative Commons Attribution License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited.

However, although the proportion of OA journals has increased, the growth of gold OA journals, which have a paywall for authors, has not necessarily led to resolving the knowledge disparity in global scholarly communication (Dalton et al., 2020; Gajović, 2020; Raju, 2018; Zhang et al., 2022). Drueliger and Ma (2023) reported that gold OA journals are more advantageous to researchers from high-income countries, whereas researchers from low-income countries may not have the resources to pay for OA publishing fees (i.e., article processing charges [APCs]). They reported that even APC waivers seem to not be practically beneficial for researchers from low-income countries. Additionally, there is misuse of the gold OA model in the publishing of predatory journals for profit. Some studies have analysed the status of predatory journal publishing and why these journals are used by researchers (Frandsen, 2019). For example, Shamseer et al. (2017) discovered that these predatory journals are more prevalent in specific regions, including developing countries, and the presence of predatory journals has further negative impacts on research systems and researchers in those regions.

Because of these concerns about gold OA journals, there has been support for OA diamond (a.k.a. platinum), which does not require payment from either the authors or the readers but rather receives funding from other sources (Hahn et al., 2023; Miedema et al., 2020). While gold OA journals charge authors fees to cover the cost of publication, OA diamond journals are entirely free to publish and read for authors and readers. OA diamond journals, which account for approximately 8–9% of the total global scholarly output (Frantsvåg, 2022), offer several benefits to the academic community. First, they provide a platform for scholars to share their research freely, democratizing access to knowledge by making it available to anyone with an internet connection, regardless of their location or financial means. Second, OA diamond journals also offer a space for scholars to publish research that might not fit into traditional disciplinary boundaries or might be considered too risky for commercial publishers. This can encourage innovative research that might not have been possible under traditional publishing models. Finally, OA diamond journals provide an opportunity for scholars to take ownership of the publishing process, allowing them to control the dissemination of their research and ensuring that it reaches the widest possible audience (Wrzesinski et al., 2021).

However, despite these benefits, sustainability has been a major concern of the OA diamond journal model (Bardi et al., 2023; Sharp et al., 2023). According to a study that surveyed OA diamond journal editors, the factors that affect the sustainability of the OA diamond journal model include financial sustainability, long-term feasibility, and journal impact factor (Bosman, Frantsvåg, Kramer, Langlais, & Proudman, 2021). Because OA diamond journals do not charge publication or subscription fees, they must rely on scholarly community support, institutional funding, or volunteer labour to cover their expenses. This can be difficult to sustain over the long term, and many OA diamond journals struggle to secure the resources they need to continue publishing (Bosman, Frantsvåg, Kramer, Langlais, & Proudman, 2021). Additionally, a relatively lower impact factor, which is often and directly related to research assessments and researchers' journal selection criteria, is another weakness in terms of encouraging researchers to publish their research outputs in OA diamond journals (Demeter & Istratii, 2020). This is partly related to journal quality control issues. Without the resources to conduct rigorous peer review or hire professional editors, these journals may struggle to maintain high editorial standards. This can make it difficult for scholars to trust the quality of the research published in these journals and may make it difficult for these journals to gain the recognition they need to thrive.

Within this context, this study aims to understand the factors of OA diamond journals publishing that are associated with their sustainability. The findings of the current study provides evidence and guidelines for enhancing the sustainability of OA diamond journal practices and, consequently, promote better knowledge equity. This study's research questions are detailed below.

Key points

- Key factors for the sustainability of open access (OA) diamond journal publishing include the region and language of the journal's publishing country and the discipline, ownership, financial status, and openness of the journal.
- Government- or national-agency-backed journals show higher sustainability, indicating the importance of stable, national-level support.
- Financial stability is crucial for the sustainability of OA diamond journals.
- Allowing unrestricted text/data mining and having policies for open research data are associated with higher sustainability.
- This study highlights the need for national and international efforts to enhance the sustainability of OA diamond journals.

METHODS

This study analysed the OA Diamond Journals Study (OADJS) Dataset (Bosman, Frantsvåg, & Kramer, 2021), which was commissioned by cOAlition S between June 2020 and February 2021. According to the report of the OADJS (Bosman, Frantsvåg, Kramer, Langlais, & Proudman, 2021), data were gathered through an online survey questionnaire in six languages and disseminated to OA diamond journals identified in the Directory of Open Access Journals (DOAJ) and related

© 2024 The Authors.
Learned Publishing published by John Wiley & Sons Ltd on behalf of ALPSP.

17414857, 2024, 3, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/leap.1611 by Ewha Womans University Library, Wiley Online Library on [20/11/2024]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

TABLE 1 Selected variables of the OA Diamond Journals Study (OADJS) Data.

Category	Questions (OADJS survey question number)
General characteristics	• In which country is the publisher of the journal based? (Q14)* • Region (Q14, OADJS)* • Official language (Q14 and Encyclopaedia Britannica)* • Income level (Q14, World Bank)* • Main discipline covered by the journal (Q40) • Who owns the journal? (Q34) • What year was the journal made available online? (Q31) • What year was the journal made available open access? (Q32) • What year was the journal made available open access without charging authors? (Q33) • How has the number of yearly articles published by the journal developed over the last 5 years? (Q38) • Approximate share of authors from outside the country where the publisher is based (Q37) • Is the journal readership more important in numbers outside of the journal's country? (Q80)
Human resources	• To what extent do you rely on volunteer effort? (Q70) • Does the journal have a trained copy editor? (Q49)
Finance	• Which of the following options describes the current financial status of the journal or platform? (Q73) • Has the journal or platform always been funded this way? (Q63)
Policy establishment/compliance with standards	• Is there a legal document establishing this ownership? (Q35) • Does the journal comply with best practice guidelines on publication practices? (Q52)
Copyright & use right	• Does the journal allow the author(s) to retain the copyright without restrictions? (Q22) • Does the journal allow reuse and remixing of content in accordance with a Creative Commons licence or other type of licence with similar conditions? (Q20)
Review process	• Does the journal use a plagiarism detection service on all submissions received? (Q51) • Please select the review process for papers published by the journal (Q26)
Dissemination/visibility	• What is the type of dissemination host or platform? (Q58) • Does the journal allow, legally and technically, text and data mining of the full text of articles by third parties? (Q59)
Openness of journal	• Does the journal provide article download statistics? (Q29) • Do you have any policy or practice to stimulate open sharing of research data? (Q41) • Does the journal require linking to data, code, and other research outputs that underlie the publication and are available in external repositories? (Q54)

* Derived variable.

mailing lists, hosting platforms, aggregators, partners, and community websites. OADJS aimed to understand 'the global landscape of OA diamond journals and platforms, identify their current funding models and their technical and organizational challenges' (p. 6).

Among the 1619 journals in the OADJS dataset, we selected 1335 journals that responded to two questions on journal sustainability and publication countries. The justifications for these selections are as follows: (1) the level of journal sustainability (*Q74. How sustainable do you consider the journal or platform in the next 3 years?*) is the dependent value of this study, and (2) the publication country is a basis for identifying related factors such as region, official language, and GDP, which are often regarded as related to epistemic inequality. The region of the journal publication country was provided in the OADJS dataset as a derived variable, official languages were identified from the Encyclopaedia Britannica website,[1] and the income levels of journal publication countries (mostly 2020 data) were identified from World Bank data.[2]

To examine the factors affecting diamond OA sustainability, we selected and reorganized the variables of the OADJS dataset in accordance with the diagnostic framework for OA journal publishing practices (Kim et al., 2023). The selected variables of the OADJS survey are presented in Table 1.

Figure 1 presents the distribution of the perceived sustainability of diamond OA journals (*Q74. How sustainable do you consider the journal or platform in the next 3 years?*) for the next 3 years from the data collection time. Using equal percentile visual binning with the number of cutpoints set at 2, the dataset was divided into three groups which were roughly equal in size: low sustainability (levels 1–7 [476 journals]), medium sustainability (levels 8–9 [421 journals]), and high sustainability (level 10 [438 journals]). The resulting binned data were then used for comparing group differences. Chi-squared test or Fisher's exact test was used to compare the low- and high-sustainability groups. All statistical analysis

[1] https://www.britannica.com/ (accessed on June 15, 2022).
[2] https://data.worldbank.org/indicator/NY.GDP.MKTP.CD (accessed on June 15, 2022).

© 2024 The Authors.
Learned Publishing published by John Wiley & Sons Ltd on behalf of ALPSP.

17414857, 2024, 3, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/leap.1611 by Ewha Womans University Library, Wiley Online Library on [20/11/2024]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

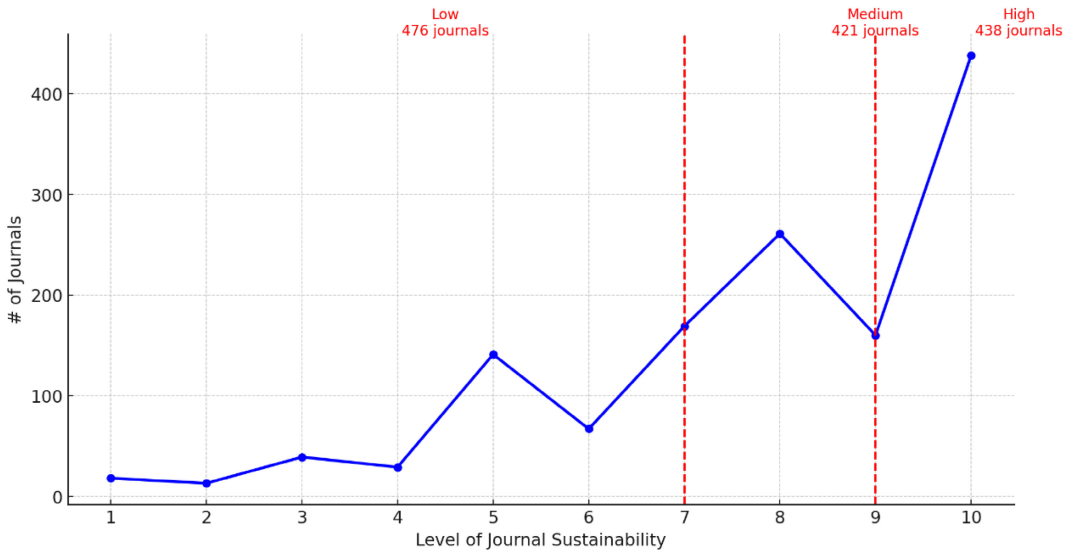


FIGURE 1 Distribution of journal sustainability level.

were performed using IBM SPSS Statistics for Windows (version 27.0), and a p value less than 0.05 was considered statistically significant.

RESULTS

Factors of OA diamond journals with low and high sustainability

Two groups of OA diamond journals, low sustainability and high sustainability, were compared. Among the variables related to publication, country, region, and official language showed significant differences between the low- and high-sustainability groups, whereas income level did not exhibit a significant difference ($p < 0.05$). OA diamond journals published in Western European and North American and English-speaking countries demonstrated higher sustainability (Table 2). Among the general characteristics of OA diamond journals, significant differences were found in terms of journal discipline, journal ownership, and the 5-year trend of article numbers ($p < 0.05$). OA diamond journals in the medicine field reported lower sustainability than other fields, while those owned by national and government agencies reported higher sustainability (*std R* >±3). The number of years a journal was online, online as OA, or online as OA diamond was not related to its sustainability. Also, neither of the variables related to globalization (share of foreign authors and perceived importance of international readership) showed a significant relationship with journal sustainability (Table 3).

As presented in Table 4, the factors related to human resources demonstrated no significant differences between the low- and high-sustainability OA diamond journal groups; however, current financial status and stability (*Q63. Has the journal or platform always been funded this way?*) showed significant differences ($p < 0.05$). The journals that reported lower sustainability tend to have a financial status showing a loss (*std R* >±2) and have been less financially stable (*std R* >±2). As presented in Table 5, the factors related to policy establishment and compliance, author and use rights, and review processes were not significantly associated with OA diamond journal sustainability. However, several variables related to journal dissemination, visibility, and openness were significantly associated with OA diamond journal sustainability ($p < 0.05$). The journals that reported higher sustainability tend to allow text/data mining of the full text of articles without restriction, stimulate the open sharing of research data, and require linking to data and other research outputs (*std R* >±2) (Table 6).

Multivariate analysis

Multivariate logistic regression was conducted with the variables that showed significant differences from the chi-square analysis ($p < 0.05$). The results revealed seven factors of high sustainability in OA diamond journals: region and official language of publication country, discipline, ownership, financial status, allowance of text/data mining of full-text articles, and open sharing of research data (Table 7). Specifically, we found that journals published in Western and Eastern Europe and Latin America had lower sustainability than those in the United States/Canada (OR = 3.6204, OR = 4.7172, OR = 6.2298, respectively). Although journals published in Spanish-speaking countries had higher sustainability than those in English-speaking countries (OR = 0.1999), journals published in English-speaking countries had higher sustainability than those in other-language-speaking countries (OR = 0.2454). Also, journals in the medical field had lower sustainability than those in Humanities

© 2024 The Authors.
Learned Publishing published by John Wiley & Sons Ltd on behalf of ALPSP.

17414857, 2024, 3, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/leap.1611 by Ewha Womans University Library, Wiley Online Library on [20/11/2024]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

TABLE 2 Factors of OA diamond journals in terms of publication country.

		Low sustainability			High sustainability			X^2	*p*
		N	%	*std R*	*N*	%	*std R*		
Region	Africa	16	3.4	0.8	9	2.1	−0.9	15.430	0.031*
	Asia	22	4.6	−0.5	25	5.7	0.5		
	Australia/NZ	7	1.5	0.1	6	1.4	−0.1		
	Eastern Europe	80	16.8	1	57	13.0	−1.1		
	Latin America	114	23.9	1.5	76	17.4	−1.6		
	Middle East	4	0.8	−0.9	8	1.8	0.9		
	US/Canada	39	8.2	−1.1	51	11.6	1.2		
	Western Europe	194	40.8	−1	206	47.0	1		
	Total	476	100.0		438	100.0			
Official language	English	82	17.2	0.1	73	16.7	−0.1	6.773	0.034*
	Spanish	101	21.2	−1.5	125	28.5	1.6		
	Others	293	61.6	0.9	240	54.8	−1		
	Total	476	100.0		438	100.0			
Income level	Low/lower middle income	24	5.1	−0.3	25	5.7	0.3	2.195	0.334
	Upper middle income	134	28.7	0.9	106	24.4	−0.9		
	High income	309	66.2	−0.5	304	69.9	0.5		
	Total	467	100.0		435	100.0			

* $p < 0.05$.

and Social Sciences (OR = 0.3287), and journals owned by government agencies had higher sustainability than those published by universities and for-profit publishers (OR = 0.2374 and OR = 0.0230, respectively). As can be expected, journals with better financial status (break-even) had higher sustainability (OR = 2.2932). Lastly, journals that allow text/data mining of the full text of articles without restriction [OR = 3.2494 (not allowed), OR = 3.1794 (allowed with restriction)] and have a policy of open sharing research data had higher sustainability than their counterparts (OR = 2.0062).

DISCUSSION

The gold OA model has been pursued as an alternative to subscription-based scholarly journal ecosystems to address issues of knowledge access inequality resulting from the sharp rise in academic journal prices. However, the gold OA model has led to the unintended consequence of predatory journals due to the profit-driven motives of their publishers and a research environment that evaluates scholars on the basis of 'publish or perish'. Moreover, research has also shown that APCs exacerbate knowledge inequality. In this context, OA diamond journals, which do not burden authors and readers with paywalls, have gained interest as another scholarly journal model in scholarly communication (Fuchs & Sandoval, 2013). However, despite these advantages, discussions have arisen about the practical barriers to sustainability due to the lack of stable resources for journal operation (Bardi et al., 2023; Bosman, Frantsvåg, Kramer, Langlais, & Proudman, 2021; Sharp et al., 2023).

This study analyses factors of OA diamond journal sustainability and provides directions for efforts to enhance their sustainability. Among them, factors such as the publishing country's region and official language and the journal's discipline are beyond the scope of what can be improved through journal operations. The factors of the sustainability of OA diamond journals were from three categories. First, OA diamond journals owned by a nation or government agency tended to report higher sustainability. Accordingly, we can interpret that a sustainability of OA diamond journals is higher when the OA diamond journals is supported at a national level. Bouche et al. (2018) insisted that since publishing is an integral component of research activities and should be recognized as a part of research infrastructure, it should be governed by the scientific community and primarily financed by research institutions. We suggest that OA diamond journals can be funded by stable and continuous national-level interest, to establish a sustainable open science research infrastructure. In some countries, such as the United States, United Kingdom, and some Western European countries, research funded by national research grants is obligated to submit to OA journals to enhance public access; consequently, the portion of research funding spent on APCs is gradually increasing.

© 2024 The Authors.
Learned Publishing published by John Wiley & Sons Ltd on behalf of ALPSP.

17414857, 2024, 3, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/leap.1611 by Ewha Womans University Library, Wiley Online Library on [20/11/2024]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

TABLE 3 General characteristics of OA diamond journals.

		Low sustainability			High sustainability			X^2	*p*
		N	%	*std R*	*N*	%	*std R*		
Main discipline	Humanities/Social sciences	239	50.2	−0.2	224	51.5	0.2	12.975	0.011*
	Science	38	8.0	−1.5	37	8.5	1.6		
	Medicine	81	17.0	−0.2	44	10.1	0.2		
	Multidisciplinary	54	11.3	1.9	46	10.6	−2		
	Other	64	13.4	0.2	84	19.3	−0.3		
	Total	476	100.0		435	100.0			
Journal ownership	Government agencies	14	2.9	**−3.2**	47	10.8	**3.3**	28.284	0.000*
	Learned society	66	13.9	−0.3	65	14.9	0.3		
	University / University press	227	47.8	1.1	179	41.1	−1.1		
	Other research org.	39	8.2	0.5	30	6.9	−0.5		
	Other non-profit publisher	23	4.8	−0.3	24	5.5	0.3		
	For-profit publisher	6	1.3	0.6	3	0.7	−0.6		
	Individual	22	4.6	−1	30	6.9	1		
	Other	78	16.4	0.8	58	13.3	−0.9		
	Total	475	100.0		436	100.0			
Year: journal available online	1990–1999	26	5.5	−0.1	25	5.8	0.1	1.648	0.800
	2000–2004	51	10.9	0.5	40	9.3	−0.5		
	2005–2009	116	24.7	−0.6	119	27.7	0.6		
	2010–2014	157	33.5	0	145	33.7	0		
	2015–2020	119	25.4	0.4	101	23.5	−0.4		
	Total	469	100.0		430	100.0			
Year: journal available OA	1990–1999	48	10.3	0.8	35	8.1	−0.8	2.519	0.641
	2000–2004	40	8.6	0.4	33	7.6	−0.4		
	2005–2009	102	21.9	−0.7	109	25.2	0.7		
	2010–2014	150	32.3	0.1	137	31.7	−0.1		
	2015–2020	125	26.9	−0.1	118	27.3	0.1		
	Total	465	100.0		432	99.9			
Year: journal available DOA	1990–1999	56	12.5	0.8	41	9.8	−0.8	4.294	0.368
	2000–2004	37	8.2	0.1	33	7.9	−0.1		
	2005–2009	93	20.7	−1.1	109	26.1	1.2		
	2010–2014	140	31.2	0.2	126	30.1	−0.2		
	2015–2020	123	27.4	0.3	109	26.1	−0.3		
	Total	449	100.0		418	100.0			
Trend in the # of articles over the last 5 years	Increased	176	37.3	−0.5	161	40.4	0.5	11.083	0.026*
	Constant	153	32.4	−0.8	149	37.3	0.9		
	Declined	24	5.1	1.6	8	2.0	−1.7		

© 2024 The Authors.
Learned Publishing published by John Wiley & Sons Ltd on behalf of ALPSP.

17414857, 2024, 3, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/leap.1611 by Ewha Womans University Library, Wiley Online Library on [20/11/2024]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

TABLE 3 Continued

		Low sustainability			High sustainability			X^2	*p*
		N	%	*std R*	*N*	%	*std R*		
	Fluctuating	81	17.2	0.5	61	15.3	−0.5		
	Jr. is less than 5 yrs.	38	8.1	1.2	20	5.0	−1.3		
	Total	472	100.0		399	100.0			
Share of foreign authors (%)	0	36	7.7	0.1	29	7.6	−0.1	1.036	0.904
	25	170	36.5	0.3	132	34.5	−0.4		
	50	119	25.5	−0.4	106	27.7	0.4		
	75	122	26.2	0.2	97	25.3	−0.2		
	100	19	4.1	−0.4	19	5.0	0.4		
	Total	466	100.0		383	100.0			
Importance of international readership	Yes	177	53.0	−0.3	158	55.8	0.4	0.497	0.481
	No	157	47.0	0.4	125	44.2	−0.4		
	Total	334	100.0		283	100.0			

* $p < 0.05$.

TABLE 4 Factors of OA diamond journals in terms of HR and financial operation.

		Low sustainability			High sustainability			X^2	*p*
		N	%	*std R*	*N*	%	*std R*		
Human resources									
Reliance on volunteer effort	Low level	41	8.9	0.6	31	7.2	−0.6	4.858	0.182
	Medium level	70	15.2	0.7	55	12.8	−0.7		
	High level	194	42.1	0.4	170	39.4	−0.4		
	No	156	33.8	−1.2	175	40.6	1.2		
	Total	461	100.0		431	100.0			
Have a trained copyeditor	Yes	328	71.5	0.7	278	65.7	−0.7	3.372	0.066
	No	131	28.5	−1.1	145	34.3	1.1		
	Total	459	100.0		423	100.0			
Finance									
Financial status	Break-even	166	49.8	−1.8	203	65.7	1.9	17.699	0.000*
	Profit	6	1.8	−0.3	7	2.3	0.3		
	Loss	161	48.3	**2.3**	99	32.0	**−2.3**		
	Total	333	100.0		309	100.0			
Has the journal or platform always been funded this way?	Yes	400	85.7	−0.7	389	92.2	0.7	9.460	0.002*
	No	67	14.3	2	33	7.8	−2.1		
	Total	467	100.0		422	100.0			

* $p < 0.05$.

Therefore, it is time to discuss whether it is appropriate for research funds, paid for by taxes, to be spent on APCs paid to commercial publishers. It is appropriate, however, to establish and maintain the infrastructure of OA diamond journals with national- and/or international-level financial support, thereby sustainably building a robust research environment infrastructure in

© 2024 The Authors.
Learned Publishing published by John Wiley & Sons Ltd on behalf of ALPSP.

17414857, 2024, 3, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/leap.1611 by Ewha Womans University Library, Wiley Online Library on [20/11/2024]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

TABLE 5 Factors of OA diamond journals in terms of policies, author and use rights, and review process.

		Low sustainability			High sustainability			X^2	*p*
		N	%	*std R*	*N*	%	*std R*		
Policy establishment/compliance with standards									
Have a legal document on JR ownership	Yes	256	71.9	0.3	219	69.1	−0.3	0.664	0.422
	No	100	28.1	−0.5	98	30.9	0.5		
	Total	356	100.0		317	100.0			
Compliance with best practice guidelines on publication practices	Yes	363	95.8	−0.2	352	97.8	0.2	2.349	0.125
	No	16	4.2	1.1	8	2.2	−1.1		
	Total	379	100.0		360	100.0			
Copyright & use right									
Author(s) copyright without restrictions	Yes	290	63.2	0.2	262	61.4	−0.2	0.313	0.576
	No	169	36.8	−0.3	165	38.6	0.3		
	Total	459	100.0		427	100.0			
Reuse and remixing right	Yes	425	94.7	−0.1	395	95.6	0.1	0.452	0.501
	No	24	5.3	0.5	18	4.4	−0.5		
	Total	449	100.0		413	100.0			
Review process									
Use a plagiarism detection service	Yes	251	56.8	−0.6	256	61.0	0.6	1.542	0.214
	No	191	43.2	0.7	164	39.0	−0.7		
	Total	442	100.0		420	100.0			
Review process	Author and reviewer identities known to each other	2	0.4	−1.1	6	1.4	1.1	6.764	0.454
	Double-blind peer review	329	69.3	0.5	287	65.5	−0.5		
	Editorial review	10	2.1	−0.1	10	2.3	0.1		
	Peer review	67	14.1	0.2	59	13.5	−0.2		
	Reviewer identities published	0	0.0	−1	2	0.5	1.1		
	Single-blind peer review	15	3.2	−0.6	19	4.3	0.7		
	Blind peer review	48	10.1	−0.3	49	11.2	0.4		
	Open peer review	4	0.8	−0.5	6	1.4	0.5		
	Total	475	100.0		438	100.0			

the long term (Miedema et al., 2020). It is worth noting that while universities/university publishers constitute the most prevalent category of publishers for OA diamond journals, their journals demonstrated both low and high sustainability. Therefore, it would be necessary to make efforts in developing models that enhance the sustainability of university/university publisher-owned OA diamond journals. For instance, although an example of monograph publication, MIT Press's Direct to Open (D2O) publishing model has been successful in implementing OA for their monographs with the support of participating libraries.

Second, the current financial status of an OA diamond journal is a factor of its sustainability. OA diamond journals that incur losses are more likely to be unsustainable. Particularly, stable and continuous funding is crucial for OA diamond journal sustainability, and the importance of national and government support may be closely related to this. While there has been discussion about the challenges of overreliance on volunteer efforts and time in the context of OA diamond journals not using subscriptions or APCs (Hahn et al., 2023), this study does not find a significant relationship between the level of reliance on volunteers and OA diamond journal sustainability. However, it is important not to

© 2024 The Authors.
Learned Publishing published by John Wiley & Sons Ltd on behalf of ALPSP.

17414857, 2024, 3, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/leap.1611 by Ewha Womans University Library, Wiley Online Library on [20/11/2024]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

interpret these results as a justification for relying on volunteer dedication for OA diamond journal operations. Instead, it would be more appropriate to focus on establishing systems and securing resources that can reduce the time and effort of editors and reviewers, thereby creating an environment where editors and reviewers can concentrate their expertise on improving the quality of the journal.

Third, factors related to the journal's dissemination, visibility, and openness were also factors of OA diamond journal sustainability. This finding supports a recent project, the CRAFT-OA project, focusing on increasing visibility and discoverability of OA diamond journals (Bardi et al., 2023). High sustainability was revealed in cases where unrestricted text mining is allowed for full-text search and use and where there are policies for open research data. Why these factors related to a journal's openness are connected to factors of sustainability cannot be fully explained with this study's data alone. However, at least, we can interpret that the directionality of open science, which aims for openness, transparency, collaboration, and inclusiveness in academia, has a positive correlation with the sustainability of OA diamond journals.

A recent study by Sharp et al. (2023) presented key questions about the future of research publishing. This report explained that as mega commercial publishers that pursue commercial profits increasingly dominate OA journals, the number of journals published by societies or small and independent publishers is decreasing. Consequently, the focus has shifted from maintaining journal quality, which was important for securing readership in a subscription-based model, to a more author-centric approach that emphasizes quantity. Mega publishers are also gradually expanding their influence in the academic community through the expansion of data analysis, scholarly

TABLE 6 Factors of OA diamond journals in terms of dissemination, visibility, and openness.

		Low sustainability			High sustainability			X^2	*p*
		N	%	*Std R*	*N*	%	std R		
Dissemination/visibility									
Dissemination host/platform	International platform	114	25.2	−0.1	97	25.5	0.1	10.838	0.028*
	National platform	65	14.3	1.2	38	10.0	−1.3		
	Institutional platform	194	42.8	0.1	160	42.0	−0.1		
	Commercial host provider	52	11.5	0.2	41	10.8	−0.2		
	Other	28	6.2	−1.9	45	11.8	2		
	Total	453	100.0		381	100.0			
Allowing text and data mining of the full text of articles by third parties	Yes, unrestricted	285	63.3	−1.7	318	77.2	1.8	20.557	0.000*
	Yes, restricted	46	10.2	1.9	21	5.1	−1.9		
	Yes, on request	49	10.9	1.3	29	7.0	−1.4		
	No	70	15.6	1.4	44	10.7	−1.4		
	Total	450	100.0		412	100.0			
Openness of journal									
Provide article download statistics	Yes	170	36.9	1.2	127	29.9	−1.3	4.854	0.028*
	No	291	63.1	−0.9	298	70.1	0.9		
	Total	461	100.0		425	100.0			
Have any policy or practice stimulating open sharing of research data	Yes	179	44.5	−1.9	216	58.5	2	15.113	0.000*
	No	223	55.5	1.9	153	41.5	−2		
	Total	402	100.0		369	100.0			
Require linking to data, code, and other research outputs, and they are available in external repositories	Yes	103	27.2	−2.1	143	39.8	2.1	13.113	0.000*
	No	275	72.8	1.5	216	60.2	−1.5		
	Total	378	100.0		359	100.0			

* $p < 0.05$.

© 2024 The Authors.
Learned Publishing published by John Wiley & Sons Ltd on behalf of ALPSP.

17414857, 2024, 3, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/leap.1611 by Ewha Womans University Library, Wiley Online Library on [20/11/2024]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

TABLE 7 Multivariate logistic regression.

Variable	OR	95% CI (LLCI–ULCI)	*p*
Characteristics of publication country			
Region			
Africa	3.4294	−0.7023 to 3.167	0.212
Asia	1.2475	−1.2744 to 1.717	0.772
Australia/NZ	0.6053	−2.3240 to 1.320	0.589
Eastern Europe	4.7172	0.1503–2.952	0.030*
Latin America	6.2298	0.3585–3.300	0.015*
Middle East	4.2391	−1.3594 to 4.248	0.313
Western Europe	3.6204	0.0192–2.554	0.047*
US/Canada	1		
Official language			
Others	0.2454	−2.5022 to −0.308	0.012*
Spanish	0.1999	−2.8798 to −0.340	0.013*
English	1		
General characteristics of journal			
Main discipline			
Medicine	0.3287	−1.9635 to −0.262	0.010*
Multidisciplinary	1.5034	−0.3149 to 1.130	0.269
Other	0.9674	−0.7929 to 0.727	0.932
Science	0.6727	−1.0359 to 0.243	0.224
Humanities/social sciences	1		
Journal ownership			
Individual	0.3309	−2.6703 to 0.458	0.166
Learned Society	0.3226	−2.4841 to 0.222	0.101
Other	0.4914	−2.0824 to 0.661	0.310
Other non-profit publisher	0.3935	−2.4977 to 0.632	0.243
Other research organization	0.2755	−2.7916 to 0.213	0.093
University/University Press	0.2374	−2.7729 to −0.104	0.035*
Government agencies	1		
Trend in the # of articles over the last 5 years			
Declined	3.7788	−0.1363 to 2.795	0.075
Fluctuating	1.4228	−0.3423 to 1.047	0.320
Increased	1.1489	−0.3790 to 0.657	0.599
Journal is less than 5 yrs.	3.0091	−0.0450 to 2.248	0.060
Constant	1		
HR and financial operation			
Financial status			
Loss	2.2932	0.3206–1.339	0.001*
Profit	1.7207	−1.0002 to 2.086	0.491

© 2024 The Authors.
Learned Publishing published by John Wiley & Sons Ltd on behalf of ALPSP.

17414857, 2024, 3, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/leap.1611 by Ewha Womans University Library, Wiley Online Library on [20/11/2024]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

TABLE 7 Continued

Variable	OR	95% CI (LLCI–ULCI)	*p*
Break-even	1		
Has the journal or platform always been funded this way?			
No	1.9615	−0.0141 to 1.362	0.055
Yes	1		
Dissemination/visibility/openness			
Dissemination host/platform			
Commercial host provider	0.8956	−0.8746 to 0.654	0.777
Institutional platform	1.1736	−0.4283 to 0.748	0.594
National platform	1.2882	−0.5258 to 1.032	0.524
Other	0.8130	−1.1561 to 0.742	0.669
International platform	1		
Allowing text and data mining of the full text of articles by third parties			
No	3.2494	0.3664–1.991	0.004*
Yes, on request	1.4909	−0.3831 – 1.182	0.317
Yes, restricted	3.1794	0.2027–2.111	0.017*
Yes, unrestricted	1		
Provide article download statistics			
No	0.9449	−0.5401 to 0.427	0.818
Yes	1		
Have any policy or practice stimulating open sharing of research data			
No	2.0062	0.1990–1.193	0.006*
Yes	1		
Require linking to data, code, and other research outputs, and they are available in external repositories			
No	1.2792	−0.2660 to 0.759	0.346
Yes	1		

* $p < 0.05$.

infrastructure, and services. In addition, as addressed in Ma et al. (2023), there is concern that the dominance of mega commercial publishers and the gold OA model contradicts an inclusive and diverse scholarly communication environment. The current study recognizes the potential of the OA diamond journal model as one solution to the problems caused by OA journals that are dominated by mega commercial publishers and proposes efforts at the national and international levels to enhance their sustainability. Miedema et al. (2020) also addressed that long-term investments from national and international consortia are necessary.

One of the major challenges in the OA diamond landscape is ensuring sustainable funding sources. Academic libraries are being recognized for their potential role in scholarly publishing. Initiatives like the 2.5% commitment, which suggests allocating a portion of library budgets to bolster open scholarly infrastructure (Lewis et al., 2018), but as revealed by Borchardt et al. (2024)'s study with the editors of Library and Information Science (LIS) journals, most of journals were not considering the transition from subscription to OA diamond models, with finance as the main barrier. However, the engagement of libraries in scholarly publishing is rapidly expanding worldwide (Ma et al., 2023), and several models have been proposed to facilitate the transition to OA diamond journals (Borchardt et al., 2024). One such model is Subscribe to Open (S2O), where if a sufficient number of subscribers commit, the content for the year becomes openly accessible. Cooperative infrastructure and

© 2024 The Authors.
Learned Publishing published by John Wiley & Sons Ltd on behalf of ALPSP.

17414857, 2024, 3, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/leap.1611 by Ewha Womans University Library, Wiley Online Library on [20/11/2024]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

funding models, exemplified by initiatives like the Open Library of Humanities, enable multiple OA diamond journals to share infrastructure and publishing services on a single platform, supported by a shared funding approach. Pure sponsorship models, such as the LYRASIS Open Access Community Investment Program (OACIP) and Jisc Open Access Community Framework (OACF), provide a framework for OA diamond journals to present detailed proposals to potential library sponsors interested in supporting aligned OA publishing. In these models, libraries contribute financial and in-kind support through publishing services, significantly reducing journal expenses (Borchardt et al., 2024). Additionally, Raju (2018) introduced the concept of 'library as a publisher', illustrated by the University of Cape Town Libraries offering OA diamond journal and monograph publishing services.

The current study provides guidelines for developing public access policies. In the United States, the 'Nelson Memo'[3], issued in August 2022, mandates immediate, free access to federally funded research, with new policies expected by January 2026. Although more and more governments, notably in the United States, the United Kingdom, and the E.U., are implementing public access policies to remove paywalls from research funded by taxpayers, ensuring fair access to knowledge, without intervention, OA may result in increased funds directed to commercial publishers instead of universities and research funders (Sharp et al., 2023). There are limitations to this study. The reliance on existing datasets and the scope of the included journals may not have captured the entire OA diamond journal landscape, and the dynamic and evolving nature of OA publishing means that these findings will need continual reassessment. However, given the absence of large-scale data including all diamond journal editors in reality, we believe that the dataset including 1619 OA journal editors can serve as a partially useful alternative. In practical terms, survey participants were recruited from various sources such as DOAJ, mailing lists, community websites, and so on, and the survey was conducted in six languages (English, French, German, Italian, Spanish, and Portuguese) for data collection. Despite potential limitations, we believe this study provides an overview of sustainability issues of OA diamond journals.

Moving forward, future research endeavours should delve deeper into the specific challenges faced within various countries and disciplines. This is essential to allow the development of targeted strategies and interventions that effectively address the diverse needs and circumstances of researchers worldwide. By gaining an understanding of these challenges, policymakers, funding agencies, and stakeholders can tailor their initiatives to better support and promote OA publishing within specific contexts. Moreover, it will be essential to examine researcher perceptions regarding OA diamond journals and their impact. Researchers' attitudes and beliefs play a significant role in shaping their publishing behaviours and decisions. Therefore, addressing any misconceptions or concerns surrounding OA diamond journals is crucial for fostering greater acceptance and adoption of this publishing model.

[3]https://www.whitehouse.gov/wp-content/uploads/2022/08/08-2022-OSTP-Public-access-Memo.pdf.

CONCLUSION

This study has analysed the factors of sustainability of OA diamond journals. While certain features like the publishing country's region and official language and the journal's discipline are outside the operational scope of journal publishing, this study underscores the features related to journal publishing that can enhance sustainability. A key finding is the role of national support in bolstering the sustainability of OA diamond journal publishing, indicating that government- or national-agency-backed journals tend to fare better in maintaining their operations. This underscores the need for a collective approach involving policymakers, funding agencies, and journal administrators to foster a sustainable OA ecosystem. Financial stability is another cornerstone of sustainable OA diamond journals. The positive correlation between journal openness—including unrestricted text and data mining and policies for open research data—and sustainability aligns with the broader open science movement's goals of transparency and inclusivity. Furthermore, this study reaffirms the potential of OA diamond journals as a counterbalance to the challenges posed by the dominant commercial publishing model, advocating increased national and international support to enhance their sustainability. Ultimately, this study proposes that the scholarly and research communities should recognize the potential of OA diamond journals and collectively transition towards a more 'scholar-led' (Wrzesinski et al., 2021, p. 5), equitable and open landscape of global knowledge sharing.

AUTHOR CONTRIBUTIONS

JungWon Yoon, and EunKyung Chung: Research design, conceptualization, and writing the original article. Halin Ku: Data processing and analysis.

ACKNOWLEDGEMENTS

This research was supported by National University Development Project at Jeonbuk National University in 2023. We thank Ms. Subin Seo for her assistance in data analysis.

CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available in Zenodo at https://doi.org/10.5281/zenodo.4553103. These data were derived from the following resource available in the public domain (Bosman, Frantsvåg, & Kramer, 2021).

© 2024 The Authors.

Learned Publishing published by John Wiley & Sons Ltd on behalf of ALPSP.

17414857, 2024, 3, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/leap.1611 by Ewha Womans University Library, Wiley Online Library on [20/11/2024]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

REFERENCES

Bardi, A., Bargheer, M., & Manghi, P. (2023). A Discovery Hub for Diamond Open Access publishing. Paper presented at 19th IRCDL (The Conference on Information and Research Science Connecting to Digital Library Science). https://ceur-ws.org/Vol-3365/short12.pdf

Borchardt, R., Schultz, T., & Dawson, D. (2024). Financial and other perceived barriers to transitioning to an equitable no-publishing fee open access model: A survey of LIS journal editors. *College & Research Libraries*, *85*(1), 96. https://doi.org/10.5860/crl.85.1.96

Bosman, J., Frantsvåg, J. E., & Kramer, B. (2021). OA Diamond Journals Study Dataset; Zenodo. https://doi.org/10.5281/zenodo.4553103

Bosman, J., Frantsvåg, J. E., Kramer, B., Langlais, P., & Proudman, V. (2021). cOAlition S: The OA Diamond Journals Study. Part 1: Findings, working paper. https://doi.org/10.5281/zenodo.4558704

Bouche, T., Miot, E., & Vaudaine, C. (2018). The launch of Centre Mersenne, a technical infrastructure to support the move towards diamond open access. In Connecting the knowledge commons: From projects to sustainable infrastructure. *Proceedings of the 22nd edition of the International Conference in Electronic Publishing (ELPUB)*. https://elpub.episciences.org/4629/pdf

Dalton, E. D., Tenopir, C., & Björk, B. C. (2020). Attitudes of north American academics toward open access scholarly journals. *Portal: Libraries and the Academy*, *20*(1), 73–100. https://doi.org/10.1353/pla.2020.0005

Demeter, M., & Istratii, R. (2020). Scrutinising what open access journals mean for global inequalities. *Publishing Research Quarterly*, *36*, 505–522. https://doi.org/10.1007/s12109-020-09771-9

Frandsen, T. F. (2019). Why do researchers decide to publish in questionable journals? A review of the literature. *Learned Publishing*, *32*(1), 57–62. https://doi.org/10.1002/leap.1214

Frantsvåg, J. E. (2022). Diamond open access in Norway 2017–2020. *Publications*, *10*(1), 13. https://doi.org/10.3390/publications10010013

Fuchs, C., & Sandoval, M. (2013). The diamond model of open access publishing: Why policy makers, scholars, universities, libraries, labour unions and the publishing world need to take non-commercial, non-profit open access serious. *TripleC: Communication, Capitalism & Critique*, *11*(2), 428–443. https://doi.org/10.31269/triplec.v11i2.502

Gajović, S. (2020). Independent, publicly funded journals adhering to platinum open access are the future of responsible scholarly publishing. *Journal of Korean Medical Science*, *35*(4), e13. https://doi.org/10.3346/jkms.2020.35.e13

Hahn, D., Hehn, J., Hopp, C., & Pruschak, G. (2023). *Mapping the Swiss landscape of diamond open access journals*. The PLATO Study on Scholar-Led Publishing. https://doi.org/10.5281/zenodo.7461728

IFLA (International Federation of Library Associations and Institutions). (2022). 10 years of the IFLA open access statement: a call to action. https://repository.ifla.org/handle/123456789/2029

Kim, N., Yoon, J., Lee, J., Joung, K., Hwang, H., Bai, S., & Chung, E. (2023). Development of a diagnostic framework and its application to open access journal publishing in Korea. *Learned Publishing*, *36*, 379–393. https://doi.org/10.1002/leap.1542

Lewis, D. W., Goetsch, L., Graves, D., & Roy, M. (2018). Funding community controlled open infrastructure for scholarly communication: The 2.5% commitment initiative. *College & Research Libraries News*, *79*(3), 133. https://doi.org/10.5860/crln.79.3.133

Ma, L., Buggle, J., & O'Neill, M. (2023). Open access at a crossroads: Library publishing and bibliodiversity, *Insights*, *36*(10), 1–8. https://doi.org/10.1629/uksg.613

Miedema, F., Verbeke, D., Sondervan, J., Woutersen-Windhouwer, S., & Oort, F. (2020). *Beyond APC: On the need for diamond open access publication platforms*. Zenodo. https://doi.org/10.5281/zenodo.4758335

Powell, A., Johnson, R., & Herbert, R. (2020). *Achieving an equitable transition to open access for researchers in lower and middle-income countries*. International Center for the Study of Research Paper. https://doi.org/10.2139/ssrn.3624782

Raju, R. (2018). From green to gold to diamond: Open access's return to social justice. Paper presented at IFLA WLIC 2018. http://library.ifla.org/2220/1/092-raju-en.pdf

Shamseer, L., Moher, D., Maduekwe, O., Turner, L., Barbour, V., Burch, R., & Shea, B. J. (2017). Potential predatory and legitimate biomedical journals: Can you tell the difference? A cross-sectional comparison. *BMC Medicine*, *15*(1), 1–14. https://doi.org/10.1186/s12916-017-0785-9

Sharp, P., Bonvillian, W., Desimone, R., Imperiali, B., Karger, D., Mavhunga, C., & Stebbins, M. (2023). Access to science and scholarship: key questions about the future of research publishing. https://assets.pubpub.org/d535ifal/Access%20to%20science%20and%20scholarship%20-%20MIT%20report%20v1.4-41701631814319.pdf

UNESCO. (2021). Draft Recommendation on Open Science. General Conference: 41st session, 9–24 November, Paris. https://unesdoc.unesco.org/ark:/48223/pf0000378841

Wrzesinski, M., Riechert, P. U., Dubois, F., & Katzenbach, C. (2021). Working with publication technology to make open access journals sustainable (No. 2021–2). https://doi.org/10.5281/zenodo.4558781

Zhang, L., Wei, Y., Huang, Y., & Sivertsen, G. (2022). Should open access lead to closed research? The trends towards paying to perform research. *Scientometrics*, *127*(12), 7653–7679. https://doi.org/10.1007/s11192-022-04407-5

© 2024 The Authors.
Learned Publishing published by John Wiley & Sons Ltd on behalf of ALPSP.

17414857, 2024, 3, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/leap.1611 by Ewha Womans University Library, Wiley Online Library on [20/11/2024]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License