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Elsevier Title Level Pricing: Dissecting the Bowl of Spaghetti

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INTRODUCTION This study will explore the issue of pricing opacity associated with prices paid by academic libraries that have recently unbundled from the Elsevier Big Deal journal package. Additionally, this study will provide metrics for assessing the fair market value (FMV) of unbundled journal packages. The pricing metrics will assist academic libraries in negotiations of subscription and open access agreements. **METHODS** Pricing information was gathered from five academic libraries. The data was analyzed to arrive at two key metrics (adjustment from list price and the average cost per journal) for establishing comparables, i.e., prices paid by similarly sized institutions, to assess the collective FMVs for unbundled Elsevier journal packages. **RESULTS & DISCUSSION** The study results show that significant variations existed in the way institutions were charged for content. Additionally, the comparables show wide variations among institutions when measured by the overall adjustment from list price and the average cost per journal. **CONCLUSION** The pricing metrics developed in this study, adjustment from list price (ALP) and average cost per journal (ACJ), will help libraries assess their final net prices for individual journal subscriptions. The results will be useful to administrators, collection development personnel, and negotiating teams in understanding the prices paid by other institutions for unbundled journal packages to determine FMVs.

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IMPLICATIONS FOR PRACTICE

1. This study provides useful comparables that libraries can and should use in future title by title negotiations with Elsevier.
2. We present evidence that leaving Elsevier's Big Deal and subscribing to individual titles can provide significant savings to libraries.
3. Confidentiality clauses continue to restrict access to critical pricing information for libraries and should be rejected going forward.

INTRODUCTION

Escalating subscription prices charged by major commercial publishers to access scholarly journals remains a major issue for academic libraries. Further exacerbating the problem are concerns surrounding pricing opacity and fairness. For example, in early 2019, after failing to reach an agreement with Elsevier (the world's largest scholarly publisher), the University of California (UC) announced it would cancel its journal subscriptions. The reason for the failed agreement was the inability of the parties to reach a mutually beneficial agreement that delivered on UC's stated goals of open access and an overall cost reduction (University of California, Office of the President, 2019; Anderson et al., 2019). For a ten campus, research-intensive system with five medical centers, the UC's cancellation was seen as a very bold step, garnering media attention both inside (Ellis, 2019; McKenzie, 2019) and outside the academy (Moody, 2019; Resnick, 2019; Zhang, 2019). At the time, it was not clear whether the UC cancellation would prove an isolated case or serve as a bellwether. The results of recent negotiations with Elsevier have shown that the UC cancellation was a glimpse of things to come.

In 2020, several major research libraries exited their Big Deal journal packages with Elsevier, including Wayne State University, Iowa State University, the University of North Carolina at Chapel Hill (UNC-Chapel Hill), and the State University of New York (Ropeke, 2020; Blouin & Westbrook, 2020; Wolfe, 2020). Most recently, MIT announced that it was canceling all of its subscriptions with Elsevier after failing to reach an agreement that aligns with its journal negotiation principles (McKenzie, 2020b). Consistent across all of the libraries' rationale for either unbundling or canceling all together are concerns over transparency and fair and sustainable pricing, qualities not typically associated with Elsevier.

Its pricing issues have been recognized by Elsevier's CEO, Kusal Bayazit. To address the issues, Bayazit has stated that her company will need "to work systematically, customer by customer, account by account to understand where they are in the pricing spectrum.

... because it is a spaghetti and we will have to undo the spaghetti step by step, working in collaboration with our customers” (Bayazit, 2020). With the addition of new analysis tools like Unsub and the rapidly accelerating budget impacts from the COVID-19 pandemic, unbundling has become a more likely approach for libraries hoping to untangle themselves from Elsevier’s pricing spaghetti (Chawla, 2020; McKenzie, 2020a).

Unfortunately, for libraries leaving Elsevier’s Big Deal package and subscribing instead to a smaller sub-set of individual titles, the same concerns over transparency and fair and sustainable pricing remain. While Elsevier does make title level list prices publicly available, several other pricing variables also are applied, making it difficult to assess what fair market value (FMV) is for any given journal. As with Big Deal agreements, title by title agreements are also commonly subject to confidentiality clauses that restrict libraries from sharing pricing and terms. Non-disclosure has left libraries negotiating for title level pricing in the dark with no sense of FMV, giving greater pricing latitude and control to Elsevier. Pricing opacity should be concerning to any library looking to unbundle since there is a high risk of perpetuating the uneven pricing and lack of transparency found with Elsevier’s Big Deals. It must also be a concern to libraries moving to open access agreements since underlying subscription prices are the basis for pricing in popular open access models such as Read and Publish and Subscribe to Open. Returning to Bayazit’s metaphor, unbundling does not guarantee that Elsevier’s pricing spaghetti will be untangled.

To help support libraries seeking to negotiate FMV title by title agreements with Elsevier, we were interested in answering the following questions in this study:

1. Are libraries quoted the same list price?
2. Are there variations in pricing components among the institutions sampled?
3. What is the total adjustment from list price (ALP) by institution?
4. What is the average cost per journal (ACJ) paid by institution?
5. Do libraries achieve savings when moving from the Big Deal to title by title subscriptions?

This study will examine how Elsevier establishes pricing for libraries that have left the Big Deal package and are subscribing to individual titles. In exploring the issue of pricing opacity, we begin by reviewing past case studies and journal package evaluation frameworks in addition to past studies on the economics of information and pricing transparency. Next, we analyze the title level pricing of five libraries that have recently left Elsevier’s Big Deal journal package to determine comparable metrics for assessing the FMV

of title level pricing. Finally, we provide recommendations for addressing pricing opacity when unbundling.

LITERATURE REVIEW

Bundled journal pricing, subscription sustainability, and value are three phrases synonymous with journal package negotiations. As subscription prices charged by large commercial publishers continue to escalate, libraries are forced to develop strategies to counter price escalations. A typical approach used by many academic libraries necessitates transitioning from the bundled journal package to title by title selection. Several institutions have documented their evaluation frameworks and attempts to unbundle Big Deal journal packages with large commercial publishers in hopes of containing rising costs (Blecic et al., 2013; Cleary, 2009; Ivanov, Johnson, & Cassady, 2020; Jones, Marshall, & Purtee, 2013; Jurczyk & Jacobs, 2014; Weicher & Zhang, 2012). For many institutions, the labor-intensive exercise entailed analyzing several output metrics, such as cost per use, citation counts, and publications. Unfortunately, the unbundling effort has proved unfruitful for some institutions, generating lower than expected savings relative to retaining the Big Deal. Several studies have concluded that the Big Deals are a better value relative to unbundling (Blecic et al., 2013; Cleary, 2009; Ivanov, Johnson, & Cassady, 2020; Jurczyk & Jacobs, 2014;). The predominant determination of value was based on either comparing account pricing to the published list price or average cost per download. Conversely, other studies have concluded that the Big Deal's value has diminished, considering that only a small portion of the bundled journals are used or cited (Jones et al., 2013; Shu et al., 2018).

Researchers also have analyzed the economics and pricing of bundled journal packages (Bergstrom, Courant, McAfee, & Williams, 2014; Moore & Duggan, 2011; O'Gara & Osterman, 2019). Understanding the economics of information and how pricing is derived are critical aspects of successful journal package negotiations. Lack of transparent publisher pricing and an understanding of what other institutions are paying for similar content, i.e., FMVs, are significant issues that limit negotiating leverage for libraries. Bergstrom et al. (2014) compared bundled pricing between commercial and society publishers. The authors concluded that prices charged to institutions vary significantly, and commercial publishers typically charge more for journal content than non-commercial publishers. O'Gara & Osterman (2019) advocated for a pricing model initiated by the consortium and based upon current economic realities rather than historical spending. The authors concluded that libraries should be proactive in pricing rather than reacting to offers tendered by commercial publishers.

No studies have investigated using title level pricing to develop comparables that establish FMV metrics for research institutions that have unbundled the Elsevier Big Deal journal package. This study will address the gap in the literature.

METHODS

We collected and analyzed five institutions' pricing variables that have left Elsevier's Big Deal journal package and subscribe instead to individual titles. The participants represent a convenience sample of institutions that recently unbundled and have a direct agreement with Elsevier. Of the institutions sampled, one preferred to be anonymized. This institution is referenced as Institution A. The study excluded consortial agreements.

Pricing information from the sample institutions was acquired in two ways. For the institutions subject to confidentiality restrictions, we submitted public records requests for the relevant pricing information. For the institutions not subject to confidentiality restrictions, we accessed pricing information that was available publicly. We obtained institutional characteristics for the participants from their websites and the Integrated Postsecondary Education Data System (IPEDS). Administered by the National Center for Education (NCES), IPEDS "is a large-scale survey that collects institution-level data from postsecondary institutions in the United States (50 states and the District of Columbia) and other U.S. jurisdictions." (National Center for Education Statistics, 2020).

For the analysis, we examined Elsevier's pricing components, including list price, content fees, e-resource fees, account price, and discount from the list price used by Elsevier to determine an institution's final net price. The content fee is a nebulous fee charged by Elsevier. The rationale behind why libraries are charged this fee is unclear. In reality, the e-resources fee is not a fee but represents a discount from the base subscription price. The first comparable metric, adjustment from list price (ALP), was determined by comparing the final net price for each institution to Elsevier's published list price. We obtained the 2020 published list price from Elsevier's website. All pricing components obtained from the sampled institutions and the 2020 published list prices have been archived and made available publically through an open dataset (Brundy & Thornton, 2021). It was not clear why the pricing from Elsevier's website did not include list prices for all journals. Nor was it clear why a final net price was not available for every subscribed title in the institutional data received. For comparability, journal titles lacking a published list price or a net price were excluded from the analysis. The exclusions were necessary to avoid skewing the data. The final net pricing was decreased by the amounts excluded (see table 1).

Institution	Amt. Excluded
Florida State University	\$1,860
Iowa State University	\$17,164
University of North Carolina at Chapel Hill	\$12,647
Institution A	\$149,364
West Virginia University	\$17,522

Table 1. Exclusions by Institution

The second comparable metric, average cost per journal (ACJ), was determined by comparing the net price to the number of subscribed titles. The ALP and ACJ were used as the primary metrics for developing pricing comparables and establishing fair market values.

Total unbundled cost savings relative to the Big Deal also were compared across institutions. We calculated the estimated unbundled savings for each institution by comparing the final year cost of the Big Deal to the first-year cost of the title by title subscription.

RESULTS

The institutions analyzed were each categorized in the highest Carnegie classification, very high research activity. The average enrollment for all institutions was 32,287. The minimum and maximum enrollments were 26,864 and 41,005, respectively. The collections budget average was \$11,215,940. The minimum and maximum collections budgets were \$7,238,587 and \$15,613,270, respectively (see tables 2 and 2.1).

Institution	Carnegie Classification (2019)	Enrollment (2018)	Collections Budget (2018)
Florida State University	Doctoral Universities: Very High Research Activity	41,005	\$10,636,428
Iowa State University	Doctoral Universities: Very High Research Activity	34,992	\$11,945,388
University of North Carolina at Chapel Hill	Doctoral Universities: Very High Research Activity	30,011	\$15,613,270
Institution A	Doctoral Universities: Very High Research Activity	28,564	\$10,646,026
West Virginia University	Doctoral Universities: Very High Research Activity	26,864	\$7,238,587

Table 2. Institutional Profile. Source: IPEDS

	Enrollment (2018)	Collections Budget (2018)
Average	32,287	\$11,215,940
Minimum	26,864	\$7,238,587
Maximum	41,005	\$15,613,270

Table 2.1 Institutional Profile Descriptive Statistics. Source: IPEDS

Pricing components varied by institutions

1. Are libraries quoted the same list price?
2. Are there variations in pricing components among the institutions sampled?

For the institutions sampled, two (Iowa State and UNC-Chapel Hill) were quoted the same list prices, which matched with the publicly posted journal list prices on Elsevier's website. However, a few immaterial variances were noted in which the quoted list prices were lower than Elsevier's published list price. For Iowa State, the variance totaled \$3,812 or .16% of the total published list price. For UNC-Chapel Hill, the variance totaled \$27,684 or 1.8% of the total published list price. Individual list prices were not received from West Virginia University, Florida State University, and Institution A. Either the institutions did not obtain the data from Elsevier, or the institutions did not provide the data in the requests. Thus comparisons to the publicly posted list prices could not be made for those three institutions. Based on this sample, we could not determine whether libraries are quoted the same list price when negotiating with Elsevier.

We found that significant variation existed among the various pricing components used by Elsevier to arrive at an institution's final net price. For example, some institutions' pricing data only included the final net price, leaving it unclear which other pricing components were or were not used. Pricing data from other institutions showed a discount off the list price, i.e., 5%, and a subsequent discount for e-content, i.e., 10%. Other institutions were charged an additional content fee (as high as 25%) and then given a discount for e-content, i.e., 10% (see Table 3). Additionally, we were unable to determine an individual institution's account price from the pricing data obtained and analyzed. However, we recognize that the account price is a critical element in determining the final net price. Elsevier clearly applies and varies the different pricing components as they see fit to derive an institution's final net price. This creates significant complexity when trying to compare pricing data between institutions.

Institution	2020 List Price	Content Fee	Content Fee Pct	Pct Off List Price	Adjusted List Price	E-Only Discount	E-Only Discount Pct	2020 Final Net Price
Florida State University	N/A	Yes	25%	N/A	N/A	Yes	10%	Yes
Iowa State University	Yes	N/A	N/A	Yes	95%	Yes	10%	Yes
University of North Carolina at Chapel Hill	Yes	N/A	N/A	N/A	N/A	N/A	N/A	Yes
Institution A	N/A	Yes	18%	N/A	N/A	Yes	10%	Yes
West Virginia University	N/A	Yes	16%	N/A	N/A	Yes	10%	Yes

Table 2. Pricing Components. N/A = means component was either not applicable for pricing or the details were not provided by institution

FMV Metrics (ALP and ACJ) varied widely among institutions

3. What is the total adjustment from list price (ALP) by institution?
4. What is the average cost per journal (ACJ) paid by institution?

The final net price was below the published list price for three institutions (Iowa State, UNC-Chapel Hill, and West Virginia). For two institutions (Florida State University and Institution A), the final net price was above the published list price and resulted in a premium paid above the list price. The average ALP for all institutions totaled -9.7% (discount from list price). The minimum ALP totaled 7.2% (premium above list price). The maximum ALP totaled -38.5% (discount from list price). The standard deviation (variation from the average) was +/- 18.7% (see Table 4 and Table 4.1).

The ACJ across all institutions was \$4,548. The minimum and maximum ACJ were \$2,448 and \$6,239, respectively. The standard deviation (variation from the average) was +/- \$1,489 (see Table 4 and Table 4.1). The average number of unbundled subscribed titles was 308. The minimum and maximum number of unbundled subscribed titles were 150 and 405, respectively (see Table 4 and Table 4.1).

Institution	2020 Published List Price	2020 Final Net Price	(1) Difference	(1) ALP	ACJ	Number of Subscribed Titles	Total Titles Available	Pct of Titles
Florida State University	\$879,358	\$935,924	\$56,566	6.4%	\$6,239	150	1,833	8.2%
Iowa State University	\$2,323,114	\$1,983,003	-\$340,111	-14.6%	\$4,896	405	1,833	22.1%
University of North Carolina at Chapel Hill	\$1,533,046	\$ 942,621	-\$590,425	-38.5%	\$2,448	385	1,833	21.0%
Institution A	\$1,789,006	\$1,918,494	\$129,488	7.2%	\$5,435	353	1,833	19.3%
West Virginia University	\$1,018,846	\$926,220	-\$92,626	-9.1%	\$3,720	249	1,833	13.6%

Table 4. FMV Metrics. (1) A positive (+) number represents the premium paid over list price. A negative (-) number represents the discount received from list price.

	(1) ALP	ACJ	Number of Subscribed Titles
Average	-9.7%	\$4,548	308
Minimum	-38.5%	\$2,448	150
Maximum	7.2%	\$6,239	405
Standard Deviation	18.7%	\$1,489	107

Table 4.1. FMV Statistics. (1) A positive (+) number represents the premium paid over list price. A negative (-) number represents the discount received from list price.

Unbundled Savings

- Do libraries achieve savings when moving from the Big Deal to title by title subscriptions?

All institutions in our sample realized significant savings from unbundling. The average unbundled savings was \$889,400. The minimum and maximum unbundled savings were \$369,000 and \$1,575,000, respectively (see Table 5 and 5.1).

Institution	Unbundled Savings	Year Unbundled
Florida State University	\$1,103,000	2019
Iowa State University	\$600,000	2020
University of North Carolina at Chapel Hill	\$1,575,000	2020
Institution A	\$369,000	2019
West Virginia University	\$800,000	2018

Table 5. Unbundled Savings

Unbundled Savings	
Average	\$889,400
Minimum	\$369,000
Maximum	\$1,575,000

Table 5.1 Unbundled Savings Descriptive Statistics

DISCUSSION

Implications for Academic Libraries

Similar to research on Big Deal pricing (Bergstrom, Courant, McAfee, & Williams, 2014), our findings demonstrate pricing discrimination by Elsevier for its unbundled, title by title pricing to libraries. Price discrimination is demonstrated across both metrics used in the analysis, ALP and ACJ. The differences being charged by Elsevier are troubling and show an opaque journal market devoid of FMV concepts. This has allowed Elsevier to construct its final net price from a confusing array of pricing components, leaving similar institutions paying widely varied prices for the same content. With its -38.5% ALP, UNC-Chapel Hill paid only \$1,404 for *Acta Biomaterialia* in 2020 while Institution A, with a 7.2% ALP, paid \$2,262 for the same subscription.

The pricing data reviewed in this study shows that the components Elsevier uses to arrive at a final net price unnecessarily add complexity and opaqueness to title level pricing. Absent comparable metrics like ALP and ACJ, Elsevier’s variable pricing components make it very difficult for a library to know whether they are paying anything close to FMV. Using ALP and ACJ, libraries can get at least some idea of how their pricing compares to their peers. However, the ultimate solution is for Elsevier to establish title level pricing

that is simple and transparent. This would allow easy pricing comparisons between institutions, and we highly recommend Elsevier move in this direction.

The wide ranges of ALP and ACJ encountered across our small sample suggest libraries have an opportunity (if not obligation) at the negotiating table to achieve more favorable pricing. The 45.8% ALP difference between the sampled institutions getting the best and least favorable pricing is gigantic. This range can be considered the playing field across which negotiations will establish title level pricing. Libraries can achieve significant savings by negotiating an ALP towards the favorable end of this range. The ALP range found in this study also shows how much work Elsevier has to do if they are going to undo, rather than perpetuate, their pricing spaghetti.

We have presented evidence that leaving Elsevier's Big Deal and subscribing to individual titles can provide significant savings to libraries. These savings arrive in year one and accrue rapidly in the ensuing years, easily reaching into the low seven figures for several libraries in our sample. This finding is at odds with earlier studies that calculated the cost of unbundling on the flawed assumption that article demand in a Big Deal package, as reflected in usage statistics, would remain when subscribing to only a sub-set of individual titles (Ivanov, Johnson, & Cassady, 2020; Jurczyk & Jacobs, 2014; Blečić et al., 2013; Cleary, 2009). The reality for libraries that have unbundled is that article demand outside a Big Deal package is lower than demand inside a Big Deal package. Furthermore, they do not have to add back high numbers of canceled titles. There are several likely contributing reasons for this. First, as Wood-Doughty, Bergstrom, and Steigerwald (2019) have shown, usage data from Elsevier is inflated relative to other publishers. Much of Elsevier's Big Deal usage is based on double-counting and does not really exist. Furthermore, some percentage of Big Deal usage is likely being fulfilled by similar content when a library unbundles. For example, some article demand is met by having an article on the topic, not a particular article on the topic. And finally, the growing percentage of articles available open access, on academic social media sites, and even pirate sites also act to reduce demand when a library unbundles. We believe current examples of libraries that have unbundled clearly demonstrate the cost savings that are possible when leaving a Big Deal. For libraries facing challenging budgets, we highly recommend exploring unbundling as a way to achieve sizable savings. Strategies that advance open access in alignment with calls for greater publisher pricing and service transparency, such as from Plan S, should also be pursued.

In completing this study, we experienced significant challenges in trying to obtain access to Elsevier pricing data. Of the libraries sampled, only two were not subject to confiden-

Subscribed Products – publisher	Access	2019 USD
ScienceDirect® online – Elsevier B.V.	sciencedirect.com	
Complete Collection		
• [REDACTED]		[REDACTED]
• [REDACTED]		[REDACTED]
[REDACTED]		[REDACTED]
• [REDACTED]		[REDACTED]
TOTAL FEES		[REDACTED]

Figure 1. Redacted pricing from a public records request

tiality restrictions. To access the other agreements and pricing, we had to submit public records requests. Three institutions were efficient and timely in fulfilling these requests; however, most were not. One informed us that only residents of the institution’s state could make such requests. Another did send pricing, but only for products we did not request. And yet another responded with the relevant documents but redacted all pricing after Elsevier asserted it was a trade secret (see Figure 1).

If this sounds familiar, that is not surprising, since it is what Elsevier tried to assert in its lawsuit in 2009 against Washington State University (Bohannon, 2014). It is disappointing that Elsevier is still trying to keep libraries from knowing what one another pay. Pricing secrecy seems at odds with what Elsevier’s CEO stated about collaborating with customers to undo its pricing spaghetti. Libraries would benefit significantly from ready access to pricing to help establish FMV. Access to pricing information will not be possible if libraries continue to sign agreements with confidentiality clauses. Furthermore, we believe Elsevier will be unsuccessful in undoing their pricing spaghetti if they continue to hide their pricing behind confidentiality clauses. Transparency is in everyone’s best interest. Both parties should say no to future confidentiality clauses that restrict the sharing of pricing information.

For a growing number of libraries, open access represents the end goal of journal negotiations, not paywalled subscriptions. New open publishing models have emerged that allow libraries to cover both open access publishing and read access under the same publisher agreement. While libraries may move directly from a Big Deal subscription agreement to an open access agreement without unbundling, these libraries still stand to benefit from title level pricing transparency and an understanding of FMV. For other libraries, unbundling may be a needed step to bring down costs before pursuing an open access agreement. No matter the direction a library chooses to go, subscription or open access,

greater title level pricing transparency and comparables will provide a more level negotiation playing field.

A limitation of this study is that the convenience sample included only five institutions and was not randomly selected. The sample was not intended to be statistically valid. Instead, the purpose of compiling the sample was to provide actionable pricing information to libraries and to create a preliminary national dataset of title level pricing metrics. The addition of pricing information from additional institutions would increase the utility and accuracy of the dataset.

Areas of Future Research

Our results highlight several fertile areas for future research. One area of growing urgency that would benefit from further investigation is establishing comparable pricing for other publishers and products commonly subscribed to by libraries. Elsevier is not the only publisher or vendor with an opaque pricing model and pricing information locked behind confidentiality language. Studies that helped establish FMV for the journals and products of other major publishers would be helpful.

A more thorough understanding of confidentiality clauses in publisher agreements is also needed. How prevalent are confidentiality clauses in publisher agreements? Why do librarians continue to sign agreements that contain such restrictions? It has been over ten years since the Association for Research Libraries Board of Directors passed a resolution encouraging its members to refrain from signing agreements with confidentiality clauses (Blixrud, 2009). Research showing the progress, or lack of progress, in reducing the use of confidentiality clauses is much needed.

CONCLUSION

Libraries have dealt with static and declining acquisitions budgets for many years. Unfortunately, the COVID-19 pandemic has accelerated declining budgets for many institutions, making it more difficult than ever for libraries to maintain their highly-priced Big Deal journal packages. Libraries who choose to leave Elsevier's Big Deal package and subscribe to individual titles should expect title level pricing based on FMV. Unfortunately, as our results show, fair pricing is not what libraries encounter. Elsevier constructs its title level prices in a complicated way that mirrors the process it has used with pricing its Big Deal packages. The outcome of this approach, as demonstrated by the pricing this study examined, is continued price discrimination and a continued lack of transparency, which perpetuates Elsevier's pricing spaghetti.

The pricing metrics developed in this study, ALP and ACJ, will help libraries assess their final net prices for individual journal subscriptions. With additional data in our pricing dataset, the metrics will become more accurate and useful to library negotiators. We hope that the number of libraries rejecting confidentiality language in their agreements will continue to grow, making this type of pricing data ever-more accessible. A transparent, fairly priced journal market is in the best interest of the entire scholarly communication community. Pricing transparency will help establish the trust that is needed as publishers and libraries work together to move away from traditional subscription agreements towards sustainable agreements that deliver open access.

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