



The Transformative Agreement paradox: A game theory analysis of large scholarly publishers and library negotiation strategies

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Abstract

The academic publishing market is evolving from a model driven by “Big Deals” to a more complex negotiation era centered on “Transformative Agreements” (TAs). Occurring within an oligopolistic market structure, this transition process provides a strong field of application for game theory to analyze the strategic decisions and reciprocal moves of the actors. This research investigates this process through game theory and inflation-adjusted data analysis. To this end, two major global datasets related to subscription and Article Processing Charges (APCs) have been converted to constant 2024 base year dollar values using the U.S. Consumer Price Index (CPI-U). The analysis reveals that the market exhibits a distinct oligopolistic structure in both the “Read” and “Publish” domains, and that the real increases in academic publishing costs systematically outpace general economic inflation (an annual average of 2.8% vs. 4.2%+). Considering these findings, it is concluded that TAs, rather than offering a solution to the ongoing crisis, function as a strategic “transaction trap” that perpetuates the oligopolistic structure. As an ultimate solution to this structural problem, the study recommends the strategic redirection of resources from the commercial market toward community-based alternatives such as Diamond Open Access.

Keywords Game theory · Transformative agreements · Academic publishing · Diamond open access · Negotiation strategy · Read and publish

Introduction

The scholarly communication ecosystem has long been grappling with a “serials crisis”, characterized by the continuous rise in journal subscription fees (Galyani Moghaddam & Talawar, 2009; Radder, 2010). At the core of this crisis is the “Big Deal” model, in which publishers license their entire journal collections as a single bundle (Peters, 2001). In response to these persistent issues, the transition to full and immediate Open Access is accelerating, with initiatives like Plan S, launched by research funders such as cOAlition S,

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making Open Access a primary goal (cOAlition S, 2018). In this new era, the prominent approach in the market has become “Transformative Agreements” (TAs). In essence, a TA is a contract through which a library’s payment to a publisher is repurposed from subscriptions to support Open Access publishing (Hinchliffe, 2019). These negotiation processes present complex dynamics between libraries and publishers that can be modeled as a strategic game. On the other hand, the central hypothesis of this research is that the transition to TAs, rather than being a solution, is an approach that further complicates negotiation processes and risks perpetuating structural cost issues. Although TAs are presented as a significant tool in the Open Access transformation, their effectiveness and sustainability require a critical evaluation. In this context, this study analyzes how the economic structure, including reading and publishing costs, is shaped within the framework of strategic game theory dynamics and aims to develop sustainable alternative strategies against this structure.

The remainder of the paper proceeds as follows: Methods describe the datasets, inflation adjustment, and game-theoretic setup; Results report market concentration and real cost growth before presenting the payoff logic; Discussion integrates these patterns into policy and implementation; Conclusion synthesizes implications.

Literature review

Despite the access opportunities provided by the digital environment, the academic publishing sector exhibits an oligopolistic structure where a few large publishers dominate the market. A small number of major publishers, primarily Elsevier, Springer Nature, and Wiley, control a significant portion of the market and the most prestigious journals (Larivière et al., 2015; Saha et al., 2021). This market dominance leads to profit margins exceeding 30–40%, which are rarely seen in other industries (Morrison, 2012). Indeed, RELX (Elsevier) achieved remarkably high adjusted operating profit margins of 38% and 38.4% in 2023 and 2024, respectively (Nicholson, 2024, 2025; RELX, 2024a, 2024b). Similarly, Wiley reported an operating margin of 26.3% and an Adjusted EBITDA margin of 34.9% for its 2023 fiscal year (Wiley, 2023), while Springer Nature also announced profit margins exceeding 27% in 2023 and 2024 (Springer Nature, 2025). These high profits are not merely a reflection of market power but also provide a strategic advantage by offering significant financial flexibility in negotiations (Trueblood et al., 2025). This financial capacity gives publishers the strength to endure prolonged negotiations and even major contract losses, such as Projekt DEAL in Germany, where a large consortium refused to sign an agreement with a publisher (Schmal, 2024; SPARC, n.d.). This situation can be analyzed within the context of game theory. Game theory is a mathematical framework for studying the strategic interactions of rational actors (here, publishers and libraries) and the outcomes of these interactions. A fundamental concept of this framework is the Nash equilibrium, which describes a state of balance where each player knows the strategies of the others and cannot achieve a better outcome by unilaterally changing their own strategy. The current negotiation structure shows that publishers are in a stronger Nash equilibrium position, enabling them to sustain ‘monopolistic pricing’ strategies (Maddi, 2021). Related game-theoretic work shows how seller market power and congestion shape negotiated outcomes, and frames open-access negotiations as repeated games in which credible outside options shift equilibria (Maddi, 2021; Saha et al., 2021).

Within this structure, the “Big Deal” model has become unsustainable in the long term due to the high costs of annual license packages and limited negotiation flexibility (McLean et al., 2021; Peters, 2001). During this period, where libraries struggled to resist mounting financial pressures, policy initiatives like Plan S emerged, mandating open access and aiming to accelerate the transformation (cOAlition S, 2018, 2023). While Plan S criticized hybrid journals, it explicitly supported “Transformative Agreements” (TAs) as a temporary but effective strategy for transitioning from subscriptions to open access (Clarke, 2018; cOAlition S, 2023).

In this context, the two main models underlying Transformative Agreements are the “Read & Publish” (R&P) and “Publish & Read” (P&R) approaches. The R&P model, the most common form of TA, is a structure where universities or consortia pay a single combined fee that covers access to a publisher’s journal portfolio (the right to read) and the costs for their affiliated researchers to publish a certain number of articles open access (the right to publish) (Clarke, 2018; cOAlition S, 2023). This model transforms traditional subscription spending to include open access publishing, allowing authors to make their articles open access upon acceptance without needing to pay an additional Article Processing Charge (APC) (Hinchliffe, 2019). The P&R model reverses the payment logic; the cost of the agreement is primarily determined by the institution’s expected publishing output, with reading access provided as part of this publishing service (Wiley and Projekt DEAL, 2019). The agreements signed by the Projekt DEAL consortium in Germany with Wiley and Springer Nature are leading examples of this model, where researchers can publish without paying APCs and have full access to content. The P&R model has the potential to offer a more transparent cost structure by directly linking payment to the number of articles published (Schmal, 2024). These agreements aim to overcome the limitations of the traditional subscription system by integrating access and publishing services, while also providing researchers with greater visibility through open access (Hinchliffe, 2019). Plan S’s definition of such agreements as a supportive transitional tool has created a new negotiation ground between publishers and libraries; initiatives like ESAC have also developed implementation guidelines to ensure transparency in billing and reporting during this process (ESAC Initiative, 2017; n.d.-a).

Transformative Agreements can contribute to the expansion of open access, particularly in large-scale arrangements, making knowledge available to wider audiences (Bakker et al., 2024; Farley et al., 2021; Hinchliffe, 2019). At the same time, studies caution that these gains are often partial and tied to hybrid models; TAs do not by themselves guarantee a full transition to open access and can entrench incumbent advantages unless transparency and cost-accounting safeguards are embedded (Borrego et al., 2021; Steinberg, 2025). Large-scale agreements, in particular, offer access to tens of thousands of journals while also enabling researchers to transition their publications to open access (Elsevier, n.d.; Wiley, n.d.). This trend is increasing awareness of open access within the academic community and paving the way for a model where all scholarly publications are eventually openly accessible (Turgut et al., 2022). However, there is also some resistance to open access publishing, particularly concerning researchers’ perceptions of the prestige of open access journals (Key Perspectives, 2004; Wijewickrema & Petras, 2017).

However, it has been demonstrated that these agreements have not fully achieved the intended transformation and come with certain structural limitations. It is noted that TAs do not guarantee a transition to open access; on the contrary, they facilitate the continuation of the hybrid journal model (Borrego et al., 2021). Similarly, various analyses have shown that TAs create a structure that can be disadvantageous for new publishing models entering

the market (Markin, 2025; Rothfritz et al., 2024). This situation points to a structural problem defined in the literature as a “transaction trap” (Rothfritz et al., 2024).

The transaction trap operates through two main mechanisms: (1) a decrease in transparency and a weakening of central bargaining power through the dispersion of costs from library budgets to researcher funds (Ben-Knaan, 2025; Hinchliffe, 2019), and (2) the strengthening of the position of large publishers through funds directed to hybrid journals (Markin, 2025). The asymmetric information dynamics pointed out by Rothfritz et al. (2024) make publishers’ ‘monopolistic pricing’ strategies explainable through game theory; the limited information libraries have about publishers’ cost structures and actual profit margins gives publishers an advantage in negotiations. These complex negotiation processes present strategic interactions that can be analyzed within a game theory framework. The “no-deal” scenario, which incurs high costs for both sides, is considered one of the main factors driving the proliferation of TAs (Maddi, 2021).

As a result of criticism of corporate practices in academic publishing, policymakers have turned to the Diamond Open Access (OA) model as a sustainable alternative. This model operates through publishing platforms that do not charge any fees to authors or readers and are generally supported by public or academic institutions. This approach aims to make academic knowledge a common good and to restore the collaborative character of the academic system (Fuchs & Sandoval, 2013). This model has gained a more institutional dimension with the DIAMAS (2025) Project’s “Diamond Open Access Recommendations and Guidelines” and cOAlition S’s (2022) Action Plan.

These developments show that sustainability discussions in the publishing field should not be limited to improving commercial agreements but should also strategically consider alternative and publicly supported models.

Data sources and methodology

This research presents a hybrid approach that combines data analysis with theoretical modeling to comprehensively examine the financial trends in the academic publishing sector. Financial trends have been evaluated by considering both historical data and the strategic interactions among stakeholders. For this holistic analysis, quantitative comparative methods and decision analyses based on game theory are integrated into a common methodological framework.

The first of the two global datasets used in the study is the Big Deal dataset created by SPARC for institutional subscription expenditures (SPARC, 2020). The dataset contains approximately 12,000 data points with pricing information obtained from third-party sources or through Freedom of Information requests. Additionally, it includes Full-Time Equivalent (FTE) data from the UK, US, and Canada, and institutional categories determined according to the Carnegie Classification of Institutions of Higher Education.

The second dataset (Butler et al., 2024) comprises Article Processing Charges (APCs) compiled by researchers from the Scholarly Communications Lab from the price lists of six major scholarly publishers—Elsevier, Frontiers, PLOS, MDPI, Springer Nature, and Wiley—for the period 2019–2023. The dataset presents journal metadata, APC collection methods, and annual APC price list information in various currencies (USD, EUR, GBP, CHF, JPY, CAD) for 8,712 unique journals and 36,618 journal-year combinations. Price lists were collected from publisher websites and via Wayback Machine snapshots (Butler et al., 2024).

The raw data in these datasets underwent a pre-processing stage before analysis. For example, currency symbols and formatting characters (e.g., “\$”, “£”, thousand separators) in the “Package Price” column were cleaned; for records containing date ranges, the final year was taken as the transaction year. To make costs from different years comparable, all data were converted to constant 2024 dollars. For this, the Consumer Price Index (CPI-U) published by the U.S. Bureau of Labor Statistics (BLS) was used (U.S. Bureau of Labor Statistics, 2024; Wyoming Department of Employment, Research & Planning, n.d.). Figure 1 shows the changes in inflation rates from 2003 to 2024. Fluctuations occurred, especially during the 2008 economic crisis and the COVID-19 pandemic. These differences were considered when comparing prices from past years with present-day values. The standard reference base for the index is set to $1982-84 = 100$, due to its alignment with updated Consumer Expenditure Surveys and its representation of a relatively stable economic period (U.S. Bureau of Labor Statistics, n.d.; Wyoming Department of Employment, Research & Planning, n.d.). This structure ensures that changes in the index are measured consistently over time.

The index shows a continuous upward trend, starting from a level of approximately 184 in 2003. During the 2008 Financial Crisis, this growth rate slowed, and the index followed a relatively stable course (Fig. 1). However, it gained significant momentum after the 2020 COVID-19 pandemic, reaching a level of 315.6 by the year 2023. This uninterrupted rise, while clearly demonstrating the impact of accelerating inflationary pressures in recent years, has made it necessary to calculate all financial values used in the study in real (inflation-adjusted) terms. Although pricing in the publishing sector is done in multiple currencies (33.8% USD, 28.6% EUR, 28.4% GBP in APC data; 24.3% USD in SPARC data), the U.S. Consumer Price Index (CPI-U) was taken as the basis due to the decisive position of the U.S. academic market. This methodological choice provides a consistent and comparable benchmark that allows for the evaluation of how sectoral price dynamics are trending relative to general economic inflation.

The process of standardizing nominal values from different years (i.e., raw, non-inflation-adjusted values expressed in the prices of that year) to a 2024 baseline required the calculation of year-specific inflation multipliers. This process enables a more accurate comparison of real changes over time by expressing data from past years in terms of 2024 purchasing power. Figure 2 illustrates how these multipliers have changed over time and demonstrates the impact of this standardization by showing the real present-day equivalent

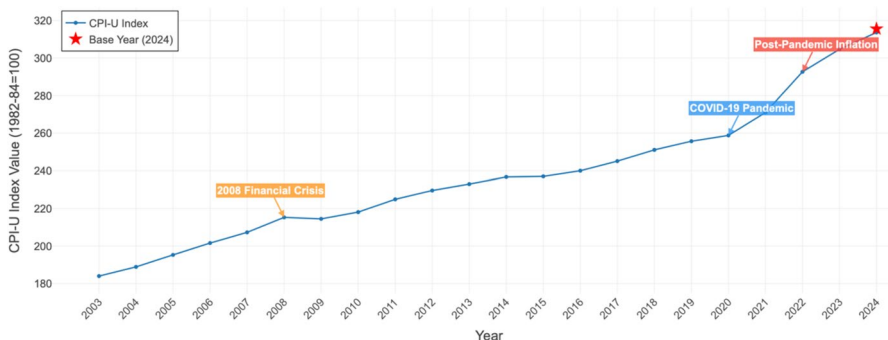


Fig. 1 CPI Historical Trend Analysis (2003–2024). *Note:* Interactive version available at: https://mugeakbulut.com/TA_Game_Theory/figure_1.html

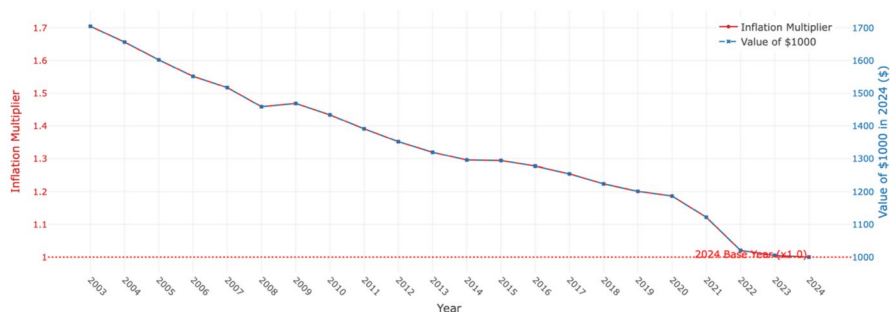


Fig. 2 Inflation adjustment multipliers and the effect on dollar value. *Note:* Interactive version available at: https://mugeakbulut.com/TA_Game_Theory/figure_2.html

of a nominal \$1,000 value from past years. However, the limitations of this approach have also been considered: it is clear that for agreements in Europe, regional inflation metrics such as the Harmonised Index of Consumer Prices (HICP) published by the European Central Bank could provide more precise analyses (European Central Bank, 2025). Therefore, while the findings of this study reflect a global framework, there is a clear need for future research to make comparative use of local price indexes.

Data limitations and robustness

Both datasets used in this study carry limitations that may influence inference. The SPARC Big Deal dataset compiles institutional subscription figures from Freedom of Information Act requests and third-party sources, and coverage varies across institutions and years (SPARC, 2020). The APC dataset (Butler et al., 2024) consists of list prices harvested from publisher websites and Wayback Machine snapshots for six major publishers; as list prices, these may not reflect all transaction-level adjustments. Heterogeneity in listed currencies and the timing of posted price lists can also lead to minor dating/FX inconsistencies. To enable comparability, all values were converted to constant-2024 USD using the CPI-U published by the U.S. Bureau of Labor Statistics; while this provides a consistent global benchmark, regional deflators such as the HICP may be preferable for European agreements and are noted as a direction for future work (U.S. BLS, 2024; ECB, 2025).

Standard statistical metrics were used on the inflation-adjusted data to measure the structural density and cost dynamics of the publishing market. The oligopolistic density was measured with the Herfindahl–Hirschman Index (HHI). This index is calculated as the sum of the squares of the market shares, taking a value between 0 and 10,000; values above 2,500 generally indicate “highly concentrated” and monopoly-tending markets (U.S. Department of Justice & Federal Trade Commission, 2010). The fluctuation in pricing strategies was measured by the coefficient of variation (CV). This metric, calculated as the ratio of the standard deviation to the mean, provides a comparable measure of price instability among different publishers (Everitt & Skrondal, 2010).

Subsequently, the findings were complemented by an analysis based on game theory to model the decision dynamics in Transformative Agreement (TA) negotiations between publishers and library consortia. Taken together, these procedures yield a harmonized panel in constant-2024 USD and a payoff framework that the Results first examine empirically and then use to motivate the strategic comparison in Table 2.

In the 2×2 strategy matrix developed within this framework, the potential choices of both parties (“to reach an agreement” or “to walk away from the deal”) were evaluated reciprocally. Although the 2×2 matrix presented in this analysis models a single negotiation moment, it is acknowledged that this interaction occurs within the broader context of a “repeated game”, where the parties consider future negotiations and their “reputation”. Therefore, the immediate payoffs in the matrix also reflect long-term strategic positioning. The payoffs were calculated based on the “Total Cost of Engagement”, which reflects the total financial burden of institutions within the scholarly publishing ecosystem. This cost encompasses both the subscription (read) fees a consortium pays to access content and the APCs its institution pays for the publication of research outputs.

The projected costs for the different outcomes of TA negotiations were calculated as follows: For the status quo scenario (the current situation without a TA), the median agreement cost of the market leader, Elsevier, in constant 2024 dollars—\$378,000—was taken as the baseline. This value was calculated by taking the median of all of Elsevier’s agreement costs in the SPARC dataset between the years 2003–2022, and then adjusting this nominal value for inflation to the 2024 base year. It was assumed that the cost would decrease by approximately 20% as a result of a successful TA negotiation, representing the consortium’s strong bargaining position, which corresponds to a value of approximately \$302,000. This rate should be considered a “ceiling” or a best-case scenario, as the literature indicates that the primary goal of many TAs is to achieve a “cost-neutral” transition rather than to reduce costs (Borrego et al., 2021). Indeed, some critical analyses even claim that TAs can be more expensive than traditional agreements due to hidden costs (Hinchliffe, 2019; Rothfritz et al., 2024). In contrast, in the scenario where the deal completely breaks down, it was projected that institutions would turn to individual subscriptions, and that the cost of this choice would increase by approximately 30% to \$491,000, in parallel with the well-documented cost shocks in the literature (Frazier, 2001). This high-cost scenario is a factor that directly affects bargaining power, as it allows consortia to form a credible threat in TA negotiations.

The hybrid methodological framework used in this study, by combining a rigorous analysis of historical data with strategic decision-making processes, offers a comprehensive and forward-looking perspective on the cost dynamics in the academic publishing sector. Through quantitative findings and game theory-based analyses, the complex nature of stakeholder interactions is illuminated, thereby ensuring coherence between empirical observations and theoretical inferences.

Results

The data presented in this section demonstrate that the academic publishing market exhibits an oligopoly structure in both the “read” (subscription) and “publish” (APC) domains. Inflation-adjusted cost analyses reveal that this structure creates an unsustainable pressure on library budgets and that TAs, rather than breaking this dynamic, actually reinforce it. This section will sequentially address the market structure, cost dynamics, and the game theory analysis that models these relationships.

Oligopolistic market structure

When the total real expenditures in the academic publishing market are examined, it is clear that the market is controlled by a few dominant actors. The data underlying this analysis encompass both traditional subscription packages (the big deal) and the APCs paid for open access publishing. The treemap analysis presented in Fig. 3 shows the extent of market dominance in light of this integrated data. The market leader, Elsevier, dominates more than 63% of the market with a total real cost of approximately \$935 million, followed by Wiley with \$215 million and Springer Nature with \$190 million. These three major publishers, holding more than 90% of the market, have this dominance directly translate into pricing power, confirming monopolistic tendencies rather than a competitive market.

The reflection of market power on costs manifests itself in the differences between publishers' average agreement fees. The market leader, Elsevier, with an average cost of \$483 K, charges more than twice the overall average (\$210 K) and applies prices more than 63% higher than its closest competitor, Wiley (\$296 K) (Fig. 4). In addition to these high costs, the distinct flexibility and variability in Elsevier's pricing strategies are clearly revealed by the error bars in Fig. 4 and the Coefficient of Variation (CV = 1.169) analysis in Fig. 5.

Pricing inconsistencies were examined through a Coefficient of Variation (CV) analysis. This analysis, based on institutional subscription agreements in the SPARC Big Deal dataset, quantitatively shows that major publishers, in particular, apply institution-specific, differential pricing policies. In Fig. 5, the CV values (standard deviation/mean) are located on the X-axis, and the analyzed publishers are on the Y-axis. The circle sizes in the visual reflect the number of agreements for the respective publisher, while the colors are adjusted according to the CV values.

The findings reveal that the oligopolistic structure of the academic publishing market is clearly reflected in publisher pricing strategies. The fact that the market leader, Elsevier, exhibits the highest coefficient of variation (CV: 1.169) and is distinctly separate from the others, demonstrates this publisher's capacity to engage in flexible, institution-specific pricing. In contrast, Canadian Science Publishing's fixed pricing policy (CV: 0.000) reflects the more standardized and less variable pricing approaches of smaller-scale



Fig. 3 Treemap Showing the Total Market Shares of Publishers (Including Subscription and APC Expenditures, in Inflation-Adjusted Constant 2024 Dollars). *Note:* Interactive version available at: https://mugea.kbulut.com/TA_Game_Theory/figure_3.html

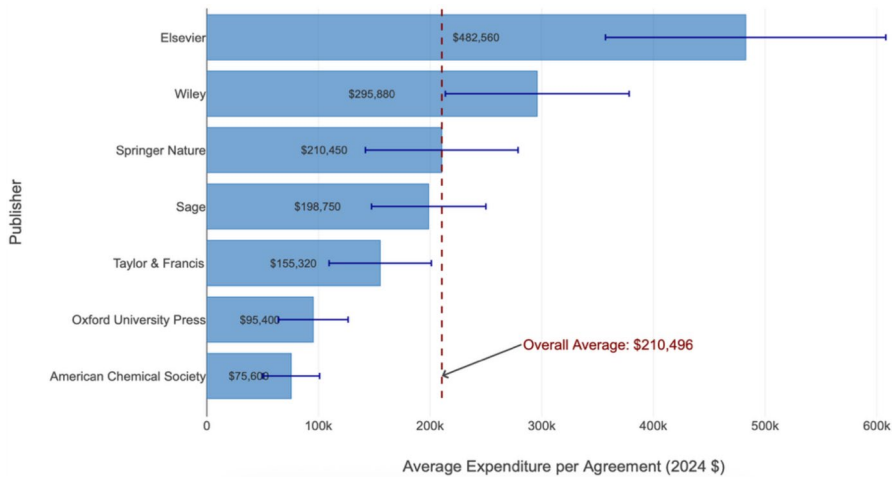


Fig. 4 Publisher real mean costs. *Note:* Interactive version available at: https://mugeakbulut.com/TA_Game_Theory/figure_4.html

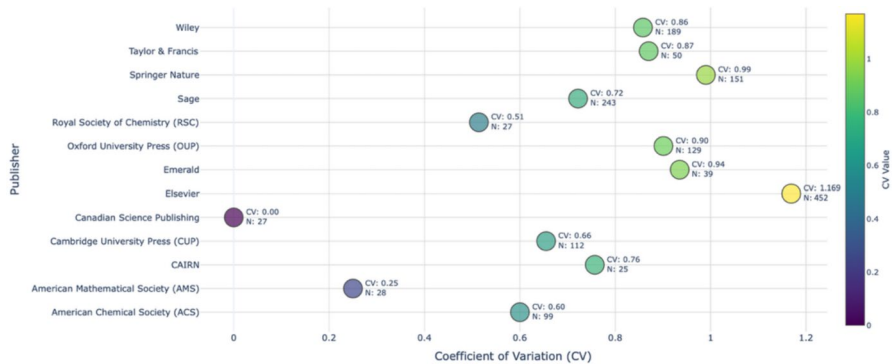


Fig. 5 Publisher Price Variation Analysis (Constant 2024 Dollars). *Note:* Interactive version available at: https://mugeakbulut.com/TA_Game_Theory/figure_5.html

publishers. This pricing variability confirms the non-transparent nature of the big deal model and the strategic flexibility of publishers in negotiation processes. Furthermore, this situation supports the thesis that Transformative Agreements (TAs) also perpetuate similar asymmetric power dynamics. This finding also reinforces the “transaction trap” concept, one of the core arguments of the research, with concrete data, strengthening the argument that the transition from the Big Deal model to TAs does not solve the structural problem and does not change the fundamental dynamics of the market. This high variability confirms that prices are determined not by fixed lists, but rather by the bargaining power of each institution and the publisher’s capacity for flexible pricing, thus pointing to a non-transparent structure.

The results first document publisher dominance on both the “read” and “publish” sides, then examine longitudinal cost growth in real terms, and finally link these patterns to the payoff logic. A similar oligopolistic structure is observed in the article processing charge

(APC) market, which represents the “publish” side. In this context, Fig. 6 shows that the dominant players of the subscription market also hold the leadership in the APC market. Wiley (real mean APC: \$3,144), Springer Nature (real mean APC: \$3,042), and Elsevier (real mean APC: \$2,736) continue their dominance in this area by pricing significantly above the overall market average of \$2,534.

The consistency in the pricing strategies of these major publishers is also noteworthy in the narrowness of the 95% confidence intervals shown in Fig. 6. This finding reveals that the market power has been directly transferred from the traditional subscription model to open access publishing, and that the “dual oligopoly” structure, the core thesis of the study, effectively controls both revenue streams. As seen in the figure, the lower mean APC values of other publishers like MDPI (\$1,384) and Frontiers (\$2,160) reflect the pricing diversity within the market.

Systematic cost increase

To reveal the extent of the real increase in academic publishing costs, an inflation adjustment was performed using data from the Consumer Price Index (CPI-U) of the U.S. Bureau of Labor Statistics (BLS). As seen in Fig. 7, there is a significant difference between the nominal costs of Elsevier subscriptions (red line) and their real costs calculated in constant 2024 dollars (blue line). This difference, represented by the orange area in the graph, signifies the “hidden inflation cost” accumulated over time. The fact that nominal costs rose from \$1.7 million to \$4.7 million in the 2017–2018 period, while real costs rose from \$2.2 million to \$5.8 million, shows that there is a systematic price increase beyond inflation.

When the 2003–2024 period is examined, it is seen that academic publishing costs show a real annual increase of 4.2%, whereas the general inflation (CPI-U) remained at a level of 2.8%. This structural difference of 1.4% can be considered a result of the pricing power that the oligopolistic structure in the sector provides to publishers. These analyses, based on the SPARC Big Deal dataset and the BLS CPI-U index (U.S. Bureau of Labor Statistics,

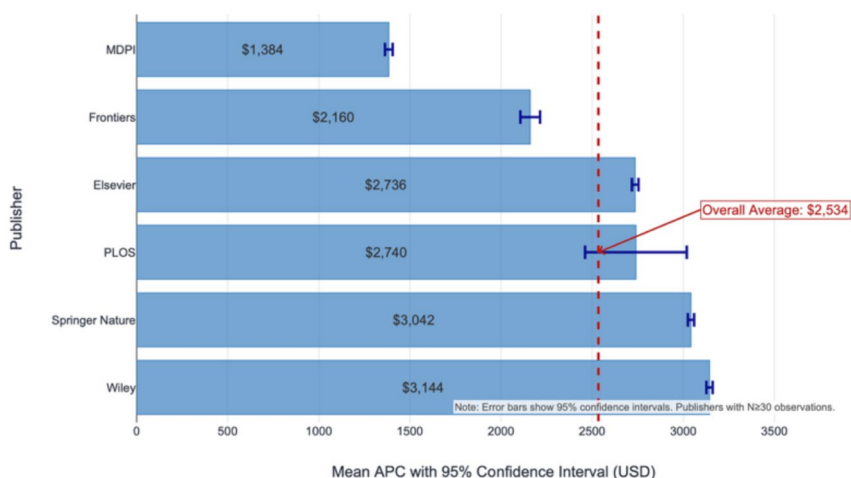


Fig. 6 Analysis Showing Publisher Median APCs with Confidence Intervals (Constant 2024 Dollars). *Note:* Interactive version available at: https://mugeakbulut.com/TA_Game_Theory/figure_6.html

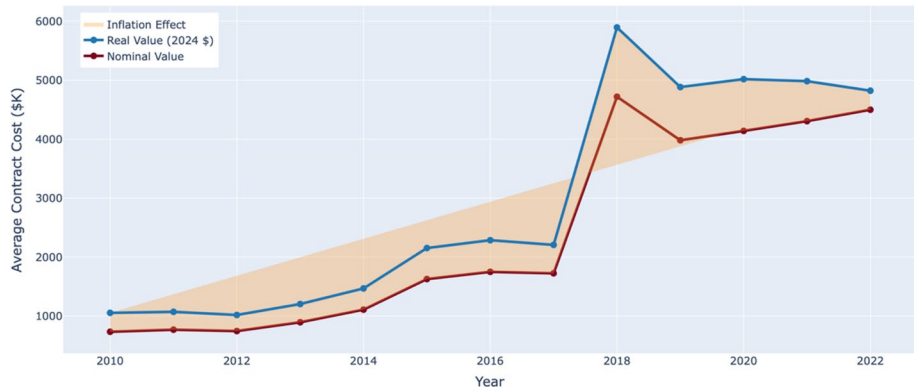


Fig. 7 Comparison of nominal value and real value. *Note:* Interactive version available at: https://mugea.kbulut.com/TA_Game_Theory/figure_7.html

2024), reveal that there are structural dynamics behind the unsustainable increase in academic publishing costs.

Game theory analysis of transformative agreements

The game theory model analyzes the strategic dynamics in Transformative Agreement (TA) negotiations. The model considers two players (the publisher and the consortium) each choosing between a high-price hybrid deal (TA) and a lower-price, infrastructure-oriented alternative. Payoffs combine access/visibility benefits and monetary costs, with each side’s outside option (e.g., walking away to interlibrary loan plus investment in community infrastructure) explicitly represented. The equilibrium concept is Nash in a repeated-renewal setting, where future periods are discounted; credible outside options shift the equilibrium away from high-price TA. In the model, the library consortium and the publisher, as rational actors, try to maximize their own interests. The payoff matrix in Table 1 shows the outcomes of the parties’ strategic choices. For clarity, the payoff structure contrasts a TA scenario with a community-owned alternative. Parameter choices are disciplined by the empirical patterns reported above: publisher leverage is proxied by concentration on the “read” and “publish” sides, cost terms reflect real (CPI-U) expenditure growth, and offset terms capture the extent to which APC charges are netted against TA payments. The monetary values in the matrix are in the format of (Consortium Payoff, Publisher Payoff), showing the consortium costs with a minus sign and the publisher revenues

Table 1 Consortium-Publisher Negotiation Payoff Matrix (Constant 2024 Dollars)

Consortium’s Strategies	Publisher’s Strategies	
	Insist on Legacy Model	Offer TA
Maintain Status Quo	(−\$378,000, +\$378,000)	(−\$378,000, +\$378,000)
Demand R&P Agreement	(−\$491,000, \$0)	(−\$302,000, +\$302,000)*

Payoffs are ordered as (Consortium’s Payoff, Publisher’s Payoff).

*Nash Equilibrium

with a plus sign. For example, the value ($-\$378,000, +\$378,000$) in the “Maintain Status Quo” scenario indicates that the consortium incurs a cost of \$378,000, while the publisher obtains the same amount in revenue. The fact that the value remains constant in this row shows that if the consortium refuses to enter into negotiations and continues the existing agreement, new offers from the publisher will be meaningless.

The costs projected for the different outcomes of TA negotiations were calculated based on three main scenarios. In the (1) “status quo” situation, where no TA is made, the consortium’s cost was set at $-\$378,000$, which is the median agreement fee for the market leader, Elsevier, in constant 2024 dollars. In the (2) “Deal Breakdown” scenario, where negotiations completely fail, it was estimated that the cost would increase by approximately 30% to $-\$491,000$, assuming that institutions would turn to more expensive individual subscriptions. In contrast, in the most favorable outcome where both parties agree, the (3) “Successful Transformative Agreement” situation, the cost was accepted to improve by 20%, decreasing to $-\$302,000$.

If the consortium’s threat not to sign is credible, the publisher is inclined to sign a TA (Nash Equilibrium). In other words, when the consortium can bring to the negotiation table the threat that “if there is no deal, we will turn to individual subscriptions, and this will be worse for all of us”, the most logical strategy for the publisher is to sign a TA by accepting a lower profit margin. This prediction of the model aligns with the reality of how collective bargaining power can force publishers into more favorable agreements, as in the case of Projekt DEAL in Germany. This situation demonstrates that the bargaining power of consortia is directly linked to their ability to increase the cost of the “no-deal” option. While stylized, the results are robust across a broad range of parameter values. As the consortium’s outside option improves (e.g., lower switching costs or co-ownership of infrastructure), the equilibrium shifts away from high-price TAs toward community-owned solutions. The main limitations are the assumptions of relatively stable period payoffs and partial information; addressing these would require a richer dynamic or incomplete-information treatment, which is left for future work.

In conclusion, these findings reveal the structural crisis of the academic publishing ecosystem with quantitative data. The “dual oligopoly” structure, where three dominant actors control more than 85% of the market in both the “read” and “publish” segments, is the fundamental reason why real costs systematically outpace general economic inflation. In this context, Transformative Agreements function as a “transaction trap” that reinforces the oligopolistic structure through asymmetric information dynamics and funds channeled into hybrid models, rather than breaking it. Therefore, the findings strongly emphasize the necessity of moving beyond reforming existing commercial models and strategically redirecting resources toward community-based and sustainable alternatives like Diamond OA.

Discussion

The game theory model developed in this study provides a framework for understanding the real-world reflections of the strategic moves of consortia. The equilibrium state predicted by the model, where the consortium forces the publisher to cooperate (i.e., sign a TA) by presenting a “credible threat”, is more than a theoretical abstraction; it has found a concrete counterpart in the case of Projekt DEAL in Germany (Vogel, 2019). The success of Projekt DEAL was based on the determination of German institutions to collectively

leave the negotiation table rather than signing individual agreements with publishers. This strategy, by increasing the cost of the “no-deal” scenario for the publisher, turned the negotiation in their favor. This situation is also consistent with the fundamental negotiation principles of Projekt DEAL: fixing costs at the level of existing total expenditure (a cost-neutral approach) and ensuring full and immediate open access for articles by German researchers (ESAC Initiative, n.d.-b). As also mentioned in the Methodology section, this dynamic confirms that the consortium-publisher relationship is essentially a ‘repeated game.’ In this structure, where the parties consider their long-term ‘reputation,’ a resolute stance today shapes future negotiations as well. However, the question of whether such successful negotiation outcomes provide a lasting solution to the fundamental problems of academic publishing is at the center of the discussion.

Indeed, recent and comprehensive studies reveal that TAs, rather than being a “bridge” to full open access, run the risk of being a ‘transaction trap’ that risks locking academia into a permanent hybrid system (Rothfritz et al., 2024). This trap operates through two main mechanisms. The first is a “cost-shifting mechanism” that moves TA costs from the library’s subscription budget to research grants and institutional funds; this obscures the true total expenditure of the institution and weakens its central bargaining power (Ben-Knaan, 2025; Hinchliffe, 2019). The second is the “funnel effect” mandated by policy initiatives like Plan S; through this effect, the vast majority of public OA funds are channeled directly to the top 3–5 publishers in the form of a de facto oligopoly subsidy (Markin, 2025).

This critical perspective makes the search for real alternatives and a shift towards community-owned structures beyond commercial models imperative. The most radical and sustainable alternative in this area is the Diamond Open Access (Diamond OA) model, which does not demand any fees from authors or readers. These initiatives are community-focused, academic-led, and are no longer a niche concept; they have transformed into a large, coordinated international movement supported by initiatives like the DIAMAS Project, the Action Plan for Diamond OA, and UNESCO’s global summits (cOAlition S, 2022; DIAMAS Project, 2025). Diamond OA is not just a different payment model, but a structural alternative that establishes community control over publishing.

This situation presents a critical decision point for libraries and funders regarding where to strategically direct resources. On one hand, investments in costly TAs serve to maintain the financial power of the commercial oligopoly; on the other hand, withholding these resources from community-based alternatives like Diamond OA limits the development and competitive power of these models. Therefore, the ultimate strategy is not just to negotiate better TAs, but to strategically reallocate funds from the commercial market to build this parallel infrastructure. Table 2 summarizes the fundamental logic of this strategic choice.

As Table 2 also shows, Transformative Agreements represent a compromise with oligopolistic players rather than fundamentally changing the existing market structure. This comparison directly motivates the policy and implementation steps that follow, specifying how incumbent spending can be reallocated toward community-owned infrastructure. In addition, recent analyses of TA business models underscore that long-term sustainability depends on transparency and demonstrable value for money—conditions that Diamond-oriented reallocation can institutionalize (Steinberg, 2025). Therefore, as Tonta (2019) and Wise & Estelle (2023) have also stated, strategically investing in this non-commercial, community-owned infrastructure is the most effective move to reduce dependency on dominant publishers and strengthen the bargaining position of consortia in the long term. This situation confronts the academic community with a conscious strategic choice based on the reallocation of resources. This approach brings to the agenda a dual strategy, a ‘Starve/

Table 2 A Strategic and Economic Comparison of OA Models

Model	Cost for Author	Cost for Reader	Publisher Control	Effect on Market Structure
TA	Usually None (Institution Pays)	Usually None (Institution Pays)	Very High	Reinforces Oligopoly
Green OA (Repository)	None	None	Low	Bypasses Oligopoly
<i>Diamond OA</i>	<i>None</i>	<i>None</i>	<i>Very Low (Community)</i>	<i>Creates an Alternative Market</i>
Preprint Archives	None	None	None (Author)	Challenges Publisher's Role

Feed' model, which involves gradually withdrawing the enormous funds transferred to commercial models whose sustainability has not been proven ('Starving'), and on the other hand, directing these resources to community-owned, permanent infrastructures like Diamond Open Access ('Feeding') (Morrison, 2012). Thus, it is a step towards fundamentally changing the rules of the game, rather than just negotiating better deals.

Implementation pathways and policy implications

While the "Starve/Feed" model provides a strategic north star, its impact ultimately hinges on concrete policy and financial mechanisms that can reallocate existing spend from commercial deals to community-owned infrastructures. Recent policy frameworks, including the Action Plan for Diamond Open Access (cOAlition S, 2022) and the DIAMAS Recommendations and Guidelines (both the detailed report and the announcement; DIAMAS Project, 2025), outline governance templates, capacity-building tracks, and funding blueprints that can be operationalized at national or consortial scales. Building on these, libraries and consortia can institute earmarked reallocation rules, for example an illustrative 5 to 10 percent reallocation of current subscription/TA budgets into Diamond OA funds, used here as a policy benchmark aligned with the evaluation/financing framework discussed by Ben-Knaan (2025). Such funds would finance shared, non-profit infrastructure (e.g., journal platforms and workflows, indexing/metadata services, repository networks) and commit to transparent, auditable cost reporting that directly links outlays to public-good outputs (Ben-Knaan, 2025; Rothfritz et al., 2024).

At the consortial level, Global South experiences such as the Colombia consortium show that collective bargaining can be coupled with local infrastructure development to reduce dependence on oligopolistic suppliers (Muñoz-Vélez et al., 2024). From an economic perspective, this complements a "Starve/Feed" rationale by gradually shifting marginal euros/dollars toward durable capacity rather than channeling additional spend into hybrid publishing arrangements (Morrison, 2012). Moreover, analyses of the business logic of TAs suggest that long-term sustainability requires transparent cost accounting and clarity on value delivered, which Diamond-oriented reallocation can institutionalize (Steinberg, 2025).

Policy levers follow naturally: (i) national matching-fund schemes (public co-funding that multiplies institutional contributions), (ii) consortial investment pools governed by libraries and research councils with multi-year commitments, and (iii) budget rules that cap

TA growth while reserving a fixed share for Diamond OA infrastructure. Over time, these mechanisms reposition libraries and funders as co-owners of a public knowledge commons, translating the “Starve/Feed” principle into a measurable pathway for restructuring scholarly communication (cOAlition S, 2022; DIAMAS Project, 2025).

Stakeholder-specific policy implications

Translating the “Starve/Feed” strategy into practice requires coordinated moves across the ecosystem. Libraries and consortia can begin by adopting earmarked reallocation rules that reserve a small but steady share of current subscription/TA budgets for Diamond OA funds and by requiring transparent, auditable cost reporting from counterparties so that spending is explicitly linked to public-good outputs (Ben-Knaan, 2025; Rothfritz et al., 2024). These practices align with ESAC guidance on workflow transparency and can be written into renewal clauses that condition agreements on regular contributions to open infrastructure (ESAC Initiative, n.d.). Funders can accelerate the shift through matching-fund schemes that multiply institutional contributions and by recognising non-APC infrastructure costs) editorial workflows, preservation, indexing/metadata services (within grant overheads (cOAlition S, 2022). Universities can institutionalise the transition by creating permanent open-infrastructure budget lines and by rewarding Diamond publishing and editorial/community service in appointment and promotion criteria (DIAMAS Project, 2025). Researchers, where scope and quality fit, can favour Diamond venues, deposit accepted manuscripts, data, and code in repositories, and serve as editors and reviewers in community-owned journals, thereby strengthening capacity on the demand side (Morrison, 2012). Governments and agencies can establish national Diamond OA funds with multi-year commitments, mandate price and itemised service transparency in publicly funded agreements, and invest in shared standards and registries to reduce coordination costs (cOAlition S, 2022; DIAMAS Project, 2025). Taken together, these steps enable a measurable reallocation from commercial transactions to community-owned capacity, turning the “Starve/Feed” principle into a concrete pathway for market restructuring while preserving access and equity. Experiences from the Global South—exemplified by the Colombia consortium—show how collective bargaining can be paired with local infrastructure development to reduce dependence on oligopolistic suppliers, aligning with the “Starve/Feed” logic (Muñoz-Vélez et al., 2024).

Conclusion

This study has revealed the strategic transformation of the academic publishing ecosystem through an inflation-adjusted perspective that goes beyond nominal values. The findings reveal that Transformative Agreements (TAs), rather than offering a solution to the ongoing crisis, function as a sophisticated “transaction trap” that reproduces the oligopolistic market structure. The fact that academic publishing costs systematically exceed general economic inflation confirms that this problem is not merely a budgetary issue, but a structural one that threatens the accessibility of scholarly knowledge.

The analytical framework of game theory plays a critical role in understanding the dynamics of this structural trap. Although the “credible threat” strategy, embodied in examples like Projekt DEAL, shows the potential for consortia to achieve better deals, these tactical successes do not transform the fundamental structure of the market.

As long as mutual dependency continues and a valid “outside option” does not exist, negotiations will not be sufficient to break the cycle of transactions favoring the oligopoly. At this point, the study concludes that real “transformation” is not about negotiating within the existing system, but focusing on building an alternative one. The roadmap proposed for the future of academic communication focuses on establishing this new game and requires a fundamental shift in perspective: a transition from transacting with an oligopoly to constructing a community-owned infrastructure. In this context, the approach that was founded in the Discussion section of this study and which stands out as the most effective long-term strategy for the academic community is the conscious adoption of the ‘Starve/Feed’ model, which involves a strategic reallocation of resources. This strategy aims to gradually withdraw funds from the commercially-driven market of questionable sustainability (Starve) and direct these resources to community-owned academic infrastructures like Diamond Open Access (Feed). Ultimately, this approach not only breaks the current cycle of dependency but also offers the only realistic and sustainable path to realizing the original vision of Open Access—a truly open, equitable, and community-owned system for sharing knowledge.

Declarations

Competing interest The author(s) declare that they have no conflicts of interest.

Declaration of Generative AI and AI-Assisted Technologies in the Writing Process During the preparation of this work, the author used ChatGPT (OpenAI) to improve the language and readability of the manuscript. After using this tool, the author(s) reviewed and edited the content as needed and take(s) full responsibility for the content of the publication.

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