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SOCIAL SCIENCES

Open access, "piracy" and Article Processing Charges (APC) in Argentina: an informed policy for the national research funding agency

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Abstract: The article explores the growing influence of Article Processing Charges (APCs) in academic publishing, especially in Argentina, and the challenges they pose for non-hegemonic countries. It highlights the shift from traditional subscription models to open access models, driven by commercial publishers, which often impose significant financial burdens on researchers and institutions. The study aims to examine the issues arising from these models, particularly the commercial open access system, to describes the actions developed by the National Agency for the promotion of Research, Technological Development and Innovation from Argentina, and to discuss some public policy proposals. One major finding is that APCs can exacerbate global inequalities in scientific publishing, as researchers from middle- and low-income countries struggle to afford these fees. This trend can distort research agendas and limit international collaborations. Besides, public research funding agencies play a crucial role in shaping publishing practices, and thus have the power to either promote or hinder more equitable publishing models. The article concludes that non-commercial open access routes, like the "diamond" model, should be promoted, and research assessments should shift away from focusing on journal rankings to encourage more responsible research dissemination. The study calls for reforms in both national and global publishing policies.

Key words: Diamond Access Journals, Open Access Publishing, Open Access with Article Processing Charges, research funding policies, transformative agreements.

INTRODUCTION

Scientific communication is carried out in various ways: at scientific meetings (congresses, conferences, etc.), by journalistic notes and interviews, through social media and academic networks as well as the main way of communicating research results in terms of volume of copies and prestige: publication in scientific journals. The ecosystem of scientific journals is also diverse: journals published by small or large research institutions and universities coexist with journals published by scientific associations and others edited by publishing groups, each one with different objectives, scope and capacities. Despite this diversity, in recent decades the process of conferring prestige to scholarly journals has been concentrated in a small set of commercial conglomerates which produce impact indicators, used in most countries to make decisions on research positions and funding. These publishing oligopolies consume the budgets of research and scientific funding institutions through the payment of subscriptions and, increasingly, through the payment of Article Processing Charges (APC) or Read&Publish agreements.

APCs or article processing charges are the prices assigned to the alleged cost of various functions: evaluating, editing, publishing, and distributing articles in a scientific journal. Until a few years ago, the prices were paid by journal subscribers or members of learned societies. But, with the rise of open access publishing, the "pay-to-publish" model has become dominant among commercial publishers, and it has been implemented on a large scale, in particular by mega-journals. These prices are currently borne by authors or institutions: to have their work published in open access, they have to pay a certain amount per article to journals which, increasingly, are run and even owned by commercial publishers.

Nowadays, open access is highly valued by researchers. One of the reasons for the attractiveness of open access is that it has been proven that citation rates are higher in open-access publications, due to a flawed evaluation system based on citation counts, but mainly because research results tend to enjoy a greater level of dissemination. But when researchers decide to publish their results in an open-access journal, they have to evaluate a number of factors that are not always mutually compatible: prestige in the field of study, journal's impact in international indexes and rankings, time taken by the journal to evaluate and publish the work and the ability to pay the price imposed by a journal, among other factors.

At the same time, research-funding agencies are under increasing demands to pay for APCs with public resources that are always limited. However, these agencies do have tools at their disposal to encourage or discourage different publication practices: the types of activities they evaluate can significantly affect the attribution of grants and, therefore, significantly affect scientific careers. Evaluating research in individual reports through the journals that are more highly valued can easily influence how each discipline or field of study orients the research agenda, funding and the publication of output. Ironically, the evaluation based on journals, rather than article content, may even lead to results that do not align with the research program and the objectives of the funding agency.

This context of actors and interests is even more complex in a non-hegemonic country such as Argentina: in the case of a highly internationalized scientific field, the dilemma of where to direct the funding of scientific publications arises up front. Is gold open access an efficient mean to boost open access? Is APC a model that improves the previous one, based on paywall? Which problems and advantages does this model present? What other options are there? The aim of this paper is threefold. On the one hand, it presents the main problems arising from the different models of management in scientific publishing, particularly the commercial business model. Secondly, it describes the studies, definitions and actions developed by the National Agency for the promotion of Research, Technological Development and Innovation (known in Argentina as Agencia I+D+i). Finally, a set of policy remarks are discussed.

MANAGEMENT MODELS IN THE MAINSTREAM PUBLISHING INDUSTRY: FROM PAYWALL TO COMMERCIAL OPEN ACCESS

Scientific publishing is, like many other industries, highly dynamical and it has adapted to social and technological changes. While digitalization favored the circulation of non-profit academic journals, it also provided fertile ground for the competitive interests of publishing companies. The open-access movement, by pledging for free and immediate access to scientific

papers, challenged the subscription model of the publishing business. But publishing companies operate in a global market, whose primary target audience are researchers, both producers and users ("produsers"), in different parts of the world, and their main consumers are the libraries. According to the STM Global Brief (2021), the academic publishing market is growing steadily since 2018, from a value of $27 billion to $28 billion in 2019.

Journal revenues in 2019 reached $10.81 billion, representing 39% of the total value of the academic market. Books accounted for $3.19 billion or 11% of the academic market. In 2020, journals fell to a value of $9.51 billion or 36% of the total market value and books increased marginally to $3.21 billion, representing 12% of the total market value. The remaining sources of revenue for the industry comprise publishing platforms and tools, technical information, events, databases and other services. The extraordinary profit rates of journals in the market are largely explained by two factors. On the one hand, companies lower the costs by resorting to the free labor of academics. Scholars produce and offer their texts from publicly funded research, while also working - without remuneration - as peer reviewers. On the other hand, the pricing of both paywalled journals and APCs per article can be raised almost indefinitely due to the standardization of evaluation systems based on rankings that give symbolic and material rewards to the best rated journals.

According to the STM Global Brief (2021), the number of new academic journals has been growing at a rate of 2% to 3% each year and the total active journals worldwide grew from 24,552 in 2001 to 46,736 in 2020. In terms of publication formats, digital journals continue to dominate the global market, accounting for 89% of 2020 publications and representing a 10% increase over the previous year. There are many data sources to establish the total active scholarly journals to the present days, such as Scopus, Web of Science (Clarivate), Dimensions, DOAJ, SciELO, Redalyc, Latindex. However, there are several inconsistencies among them and the specialized list that could provide a global figure, Ulrich's Directory, does not cover all the journals edited outside the "mainstream".

Commercial open access is growing rapidly, both in terms of value and volume. Although it is increasing its share within the commercial models of academic publishing, it is not yet the dominant model. Just over 30% of all academic articles are published as paid open access (STM Global Brief 2021). It is estimated that there are around 29,000 non-commercial open access journals globally (Bosman et al. 2021). Since 2018, the proportion of articles in diamond journals has been decreasing while articles in APC-based journals have increased in number. Part of this is explained by the fact that the diamond journals belong in a significant part to social and human sciences (Bosman et al. 2021). Still, another factor prevents many diamond journals to be visible in the global studies: there is no platform or database inclusive for all Latin American journals. The studies in the frame of the Oliva Project (see https://cecic.fcp.uncuyo.edu.ar/oliva/) attempt to collaborate in this direction (Beigel et al. 2023).

The scientific publishing market is described in the literature as an oligopoly because it is dominated by a small group of large publishers (Larivière et al. 2015). Four publishing conglomerates (Elsevier, Springer Nature, Wiley and Taylor and Francis) concentrate journals originating from the UK, the Netherlands, Germany and the US. In the Social Sciences and Humanities, SAGE must be mentioned in addition to the previous. In the areas of Medical and Natural Sciences, the American Chemical

Society (ACS) produces an important share of the articles in these fields. Other smaller publishers manage journals in a wide variety of countries and regions. Besides, there are thousands of journals published by research institutes, universities or public organisms that are edited without the intervention of commercial publishers, being Latin America the most relevant case. There are important differences among the journals, one of the most important of which is the differential value conferred to them by users, linked to the recognition they obtain in their institutions' research assessment systems (Luchilo 2019). The diverse results of these publications in terms of tenure or promotion in the academic career have created segmented circuits of recognition (Beigel 2024).

The publishing oligopolies expanded since the 1990s through company merging and agreements with scientific or professional associations that allowed to acquire numerous prestigious journals. The market power was thus concentrated enough to negotiate higher prices and subscription agreements with libraries. In recent years the publishing business included the provision of information solutions (repository management services, management and information services, preprint platforms and databases, among others associated with open access). The collateral effects of this commoditization process is the uniformization of editorial processes and the loss of control of by the academic editors, as well as the increasing emergence of questionable, spurious or outright predatory journals (Sivertsen & Zhang 2022, Beigel 2024).

The traditional paywall publishing business has worked thanks to the combination of the oligopolistic market structure and the exclusive property over the content which remains under an onerous subscription. The subscription was usually institutional, with libraries, institutes or governments entering into access agreements. The relevance of these collections for the scholars and the institutions is related to the priority given to Scopus or Web of Science in the University Rankings and funding assessment. Both databases are private companies and for-profit. Scopus is a large bibliographic database of abstracts and citations of scientific journal articles owned by Elsevier and accessible only to subscribers. Similarly, Web of Science (WoS) is an online scientific information service, belonging to Clarivate Analytics, which provides access to a set of databases indexing the content of various fields of knowledge. It is also accessible only to subscribers. Access in this case can be purchased on per-article, per-journal or per-package basis. Prices per article and per journal vary widely, showing a steady price increase of between 5% - 6% per year. The option most sought after by commercial publishers is the big deal, where access to a large number of journals is offered at a lower price than the sum of all of them. Today, these deals have been replaced by transformative agreements to read& publish, as we will see below.

The commercial model of access to scientific communication presents several problems for the Global South and also for the global conversation of science itself. On the one hand, small journals from professional associations do not participate in library selection processes because governments and institutions that sign these agreements are subject to the rules imposed by the publishing groups. From the point of view of the final users (researchers) they will only have access to the package their institution has been able to pay for. For peripheral countries, this model deepens inequalities in access to scientific knowledge because there are few resources available and therefore few subscription contracts. From all points of view

and concerning science as a common good, there is an unpaid appropriation of economic benefits by publishers when they keep the intellectual property of articles obtaining a license for free from authors whose do not receive any payment for the publication. There is an increasing tendency to impose payment for publication, favoring a double appropriation: when publishers appropriate scientific works without paying copyright to the authors and when they charge for publishing in open access.

"PIRACY", BOOSTED BY COMMERCIAL OPEN ACCESS

In recent decades, the publishing industry had to deal with the emergence and consolidation of the open access movement, as well as with "piracy". This is not an isolated phenomenon because it took place in a broader context in which all industries had to, in one way or another, respond to the phenomenon of illegal copying (medicines, films, music, books, etc.). These responses, which involve multiple actors and interests weaving alliances and designing global strategies, are part of the process of expansion of intellectual property in the last quarter of the 20th century within the framework of so-called cognitive or informational capitalism. Unlike the previous stage (industrial capitalism) in which matter and tangible goods played a central role in economies and societies, in informational capitalism it is knowledge in general, and digital information in particular, that play a key role. This happens up to a point that suggests an association between knowledge accumulation and economic development. The use of productive knowledge depends, however, on intellectual property regulations that determine who can access it and under which circumstances, giving rise to different forms of use and reproduction of knowledge (legal, illegal, for-profit, or not-for-profit...). One of such forms is unpaid appropriations, i.e., situations in which an actor takes advantage of productive knowledge to develop without paying for it. The dominant view, stemming from neoclassical economics, holds that unpaid appropriations of knowledge are detrimental to development, since in the absence of high intellectual property standards, firms will not invest in the creation and dissemination of knowledge, given the risk that other actors will appropriate this knowledge for free, hence their frontal and fierce fight against "piracy". There is, however, ample historical evidence showing the relation between unpaid appropriations of knowledge and accumulation of knowledge and capital (Haro Sly & Liaudat 2021, Liaudat 2021, Liaudat et al. 2020, Lund & Zukerfeld 2020, Zukerfeld 2016).

The use of illegal ways of access to knowledge, on its part, is far from being an anomaly. Paradoxically those who have used it most (and continue to do so) are the actors located in central positions who try to prohibit it these practices for those located in peripheral positions. This is the case of various economic branches and of the academic publishing industry (Zukerfeld et al. 2023a). In fact, large publishing groups that were initially reluctant to open-access, created or acquired open access journals with APC using unpaid appropriations of knowledge: Springer acquired 250 and Wiley 170 journals, or developed hybrid access of journals combining APC and subscription. They also undertook other actions such as direct opposition to open access by supporting very restrictive bills such as the SOPA (Stop Online Piracy Act) and PIPA (Preventing Real Online Threats to Economics Creativity and Theft of Intellectual Property Act); they took measures to prevent researchers from uploading articles in repositories such as Researchgate and Academia.edu and started to provide complementary

open access services (Luchilo 2019: 61-62). Table I shows a typology of these practices based on two variables: legality and profit.

Table I shows the unpaid use of scientific publications by different actors, for different purposes and through different channels: a) when it appropriates scientific works without paying royalties to the authors (paywall model), b) charging for publishing in open access (golden or corporate and hybrid pathways) or c) appropriating the unpaid work of reviewers and editors. These are legal for-profit appropriations. There are other types of appropriation, also legal but not for profit, such as institutional repositories (green path) and non-commercial open-access journals, generally from scientific societies (diamond path). These latter forms of open access were promoted by funding institutions that designed public policies such as the obligation for publicly funded research to be available in institutional repositories. In some cases, the creation of open-access journals was also encouraged.

THE COALITION S AND TRANSFORMATIVE AGREEMENTS

The latest milestone in the journey of the scientific publishing industry is the emergence of the transformative agreements, following the consolidation of Plan S, an initiative of the European Research Council, and several European national agencies with the aim to make all scientific publications resulting from publicly funded projects immediately accessible in 2021. Transformative agreements between institutions and publishers transform the business model underpinning academic publishing from a subscription model to one in which publishers assure reading but also exemption from paying APCs for journals that are part of the signed agreements. Even if these agreements have differences among publishers, they have some common features. On the one hand, they are transitional concerning hybrid models, as the ultimate goal is pure open access. On the other hand, they have to allow authors to retain the intellectual property of their works. Coalition S demands that they must avoid double payment and include clauses that facilitate administrative management (Sánchez García 2021). They have already been signed by different institutions, such as the Conference of Rectors of Spanish Universities (CRUE) which in April 2021 closed the agreement with Wiley, Elsevier, Springer, and ACS. In Latin America, Consorcio Colombia was a pioneer in concluding these agreements (it currently

Table I. Typology of unpaid appropriations of knowledge in scientific publications.

Unpaid knowledge appropriations	Legal	Illegal
For profit	Scientific publishers in the 21st century: Closed legal model *(paywall)* Open legal model (commercial gold route and hybrid route)	Paid access behind the shadows of libraries (91lib.com from China)
Non-profit	Institutional repositories (green path) Scientific and academic publishing institutions, non-commercial open access journals (diamond path)	Libraries in the shadows with free Access (Sci-Hub, LibGen) Scientific piracy through social networks, photocopying of texts, etc.

Source: own elaboration based on Liaudat et al. (2020) and Zukerfeld et al. (2023a).

has 144 agreements with three publishers in its portfolio), followed by the University of Concepción in Chile and the National University of Mexico (UNaM) which signed agreements with 13 scientific publishers during the last year.

Those who support this kind of agreements claim that one of the advantages is that they favor the visibility and dissemination of research by publishing in high-impact open access journals. Also, they argue that the flow of APCs would be controlled and centralized; and that there would be savings in APC payment costs. However, a study of 429 transformative agreements found that in 61% of the cases, no more but also no fewer APCs were paid, and only 13% of the cases were paid less (Godínez-Larios 2024). The most recent experiences, such as the agreement signed by UNAM, show that exemption from APC payment is not automatic and that each researcher ends up managing his or her specific case through the library, not always with success.

Another argument against transformative agreements hold that small and medium-size publishers could be harmed, as well as publicly funded journals that do not charge APCs and makeup 70% of the titles included in the DOAJ database (Sánchez García 2021). The transformative agreements help to consolidate the predominance of the APC payment model as, which can significantly harm this type of journals unable to compete with the mainstream journals as they have lower impact factor and less demand. In addition, the S-plan demands technical requirements on download data, citations and altmetrics for all articles published in open access that the small academic publisher does not have, as it has neither the necessary technological infrastructure nor the expertise to do so. So the new funding system for publishing groups would weaken the management of journals by academia, benefiting those who originally opposed open access and penalizing pure open access publishers (Sánchez García 2021).

OPEN ACCESS AND APC FUNDING ARGENTINA

From the discussion above emerges that the original definition of the "golden" route, as defined in the Budapest Declaration on World Heritage (2002), was colonized by the commercial publishers seeking to transfer the costs of open access to the authors and institutions to secure revenues. Bearing in mind that the classification of open access is still a contested issue, we provisionally define the open access routes as follows:

- *Commercial gold route*: the journal is published by a for-profit commercial publisher, it is fully accessible, and costs are covered by authors (APC) or by institutions usually through read&publish agreements. They may offer exemptions or waivers for researchers from low-income countries that are negotiated individually.

- *Hybrid route:* these are articles published in open access in subscription journals. The Open access option is covered by the authors (APC) or by institutions, usually through read&publish agreements. They may offer exemptions or waivers for researchers from low-income countries that are negotiated individually.

- *Green route* (pre- or post-print): these are pre- or post-publication versions of articles that are accessible freely through institutional repositories, personal pages, and networks.

- *Diamond route:* full open access journals, which do not charge for publication or access. Diamond journals are not usually owned by commercial publishers, but there are cases of learned society journals that have institutional

agreements with the publishers that allow to exempt the APC payment.

In the subscription model, the central problem was the restricted access to scientific research. In the commercial gold route, the difficulty lies in an equal participation in science circulation. However, these models share some common elements. Firstly, in both models, there is an appropriation of the research results of the publishing authors, as in neither of each the authors are paid for their work. Secondly, in both models the publishing business is built on an activity whose main input provided for free by researchers who participate in reviewing the publications of others. Thirdly, in both models, the public institutions that funded the research end up paying for it two or three times (when they pay subscriptions or when they pay APCs). This suggests that, whether the publishing institution pays to access or its researchers to publish, there is an appropriation of public resources by private publishers.

Commercial open access has not progressed equally across all disciplines. Fields such as Biology and Health Sciences heavily utilize the gold open access route, fostering the development of mega-journals that efficiently and rapidly meet researchers' needs to publish in high-impact outlets. This is not only critical for career advancement but also essential for securing international grants.

A recent study by Zukerfeld et al. (2023b) analyzed the criteria prioritized by researchers at the National Council for Scientific and Technical Research (CONICET) when selecting publication venues. The study found that these researchers overwhelmingly prioritize impact indicators, with 73% indicating this as their top criterion.

In face of this landscape, various problems arise for a country as Argentina. Firstly, there are severe economic and financial problems to pay increasing APC costs. They are supposedly set according to the journal's impact factor, editorial processes, market conditions and number of articles received. On average they can cost from 2.000-3.000 US dollars. Waivers are available in many journals but not for a middle-income countries and subscription agreements have been cancelled. This affects both individuals and institutions, the first ones when they assume personally to pay these amounts, and the institutions because these prices and the transformative agreements can be prohibitive, deepening the inequities of the global academic system (Fushimi et al. 2022: 5). A recent study on APC costs in Argentina shows that in average, the articles published by authors affiliated to this country cost USD $2.112 and the total expenditure from 2013-2020 for correspondence authors was estimated in USD $11.600.000 (Vélez Cuartas et al. 2022).

Secondly, APC costs can lead to lose international leadership because the paying researchers could demand to be first or corresponding author even if their scientific contributions were minor. Another collateral effect can be the distortion of research agendas. The international survey on APC performed by the Global Research Institute of Paris (GRIP) revealed that many researchers from different countries felt compelled to collaborate with authors capable of paying APC (Gallardo et al. 2024). These deviances from free scholarly choices can also affect open access. Vélez Cuartas et al. (2022) showed that open access publications by the country reached a 53% of the total articles while at CONICET, this figure is inverted and only 46% of the output was published in open access.

Thirdly, it has been argued that commercial open access can push the researchers to questionable or predatory journals. There is no consensus with the definition of "predatory" journals, although these are mostly featured

by no formal peer review, APCs in exchange for quick publication, misleading, exploitation of vulnerable researchers, commercial open access has boosted new types of spurious publications which reflects the transformation of mainstream publishing and a segmentation of the circuits of recognition that is still in progress (Beigel 2024).

In front of all these determinants, national funding institutions face complex challenges for designing coherent public policies for the APC problem. Certain actions can favor or diminish its incidence, as well as encourage private appropriation. In Argentina, Law 26.899 on Open Access Institutional Repositories was passed in 2013. This law establishes that institutions of the National System of Science, Technology and Innovation (SNCTI) that receive funding from the national state, must develop their open access institutional digital repositories to deposit all its output. Although the repositories also involve some unpaid appropriation, in these infrastructures the accumulation of capital is in favor of public institutions and in detriment of the publishing oligopoly. However, some university libraries and researchers demand read&publish agreements with mainstream publishers as the path to solve the open access publishing problem.

The debate presented in the national research funding agency (AGENCIA I+D+i) can be summarized with the question: to what extent should a public agency accept the use of research funds to pay APC journals? And what kind of publications are rewarded when evaluating research fund applications? Moreover, in Argentina, there is a wide range of diamond journals available, but their lack of recognition in research assessment diminishes their ability to become a short-term alternative for those groups and individuals who cannot afford to pay for APCs. This proves that the funding actions developed at the national scale to solve the APC problem cannot advance without a reform of evaluation towards a more responsible research assessment.

ACTIONS AT THE NATIONAL AGENCY FOR THE PROMOTION OF RESEARCH, TECHNOLOGICAL DEVELOPMENT AND INNOVATION (AGENCIA I+D+i)

The concern about access to scientific publications and participation in the international scientific arena was taken as a priority at the Agencia I+D+i agenda since the new government arrived in December 2019. The presidency of the Agencia I+D+i between 2019 and 2023 was led by Lic. Fernando Peirano, an economist specialized in Innovation and Developmen. At that time, a two folded diagnosis was built: on the one hand, there was an absence of an explicit intellectual property policy and general guidelines. On the other hand, it soon became clear the urgent need for a data/policy on intellectual property rights for the results of the project funded by the Agencia. The "Guidelines for an Intellectual Property Policy in the Agencia I+D+i" (Terlizzi & Zukerfeld 2023: 331-338) intended to respond to these and other emerging issues.

The Guidelines include several considerations that relate with scientific publications.

First, the criteria of openness and appropriability emphasize that, to "achieve wide dissemination and a federal and inclusive use by various social actors within our National System of Science, Technology, and Innovation (SNCTI) and society in general, the knowledge funded by the Agencia I+D+i must result in public goods." However, this does not imply that it is the sole criterion to consider.

This principle must be balanced with situations where appropriation through registration and ownership—or other

mechanisms—by public or private actors is deemed the most suitable way to ensure the development of knowledge and its transfer to the productive sector and society. Furthermore, "special attention should be paid to regulations that allow foreign actors, particularly private ones, to profit from or own intangible assets partially or entirely financed by the Agencia I+D+i and other national public bodies, to the detriment of national public institutions and private actors" (Terlizzi & Zukerfeld 2023). These scenarios should be avoided unless it is unequivocally demonstrated that such profit or ownership by foreign entities contributes to Argentina's scientific, technological, and productive development. Additionally, the scope and manner of this commercial exploitation, profit, and ownership must be explicitly defined in contractual agreements.

Secondly, regarding open access publications, the Guidelines state that the Agencia I+D+i is committed to contribute to the implementation of Law No. 26.899 on Open Access Institutional Repositories and with the definition and principles supported by the UNESCO Open Science Recommendation 2021. More specifically, the Agencia I+D+i supports non-commercial open access, i.e., green and diamond pathways. For this, "actions, incentive policies and instruments will be studied to promote non-commercial open access publication, particularly in indexed journals in Argentina, to the extent that this is possible and does not limit cooperation and the international visibility of researchers and research results, respectively". Being aware of the problem of visibility, it also points out that "Open access through the corporate gold pathway -which involves payment of APCs by authors- will only be supported exceptionally in cases where it is clearly justified to continue international cooperation and visibility, where there are no equivalent non-commercial open access alternatives, and while the transition to the latter one is underway".

The Guidelines are general principles that each research fund instrument operationalize according to the conditions of the case and specific Call. Accordingly, when the Scientific and Technological Research Projects (PICT) were launched in 2021, the model contracts introduced the reference to the obligations of Law 26.899 and the commitment not to fund publications in open access via APC payments. When needed for requesting waivers, letters explaining these contract limitations were issued to those researchers that asked for these.

The Agencia I+D+i's open access policy was informed by reports and recommendations grounded in empirical studies. In their report on APC (Article Processing Charges) costs in Argentina and expenditures by the Agencia I+D+i from 2013 to 2020, Beigel & Gallardo (2022) analyze the rapid transformation of national scientific publications toward open access. They highlight the implications of the growth of APC journals for researchers and the public funding of science in Argentina.

The report analyzes expenditure invoices from projects funded by the Agencia I+D+i between 2014 and 2020 and estimates the total volume of APC payments for publications authored by Argentine scientists. Verified APC expenditures during this period amounted to USD 1,317,536, while the estimated total costs for the complete publication output recorded in the database reached USD 13,906,326. The study concluded that a significant portion of the estimated APC costs was covered through international funds or waivers. However, the share financed by the national agency was determined to be unsustainable.

Observing these expenditures by discipline, it the report notices that more than 60% of APC

expenditure funded by the Agency is in the area of Biological and Health Sciences (CBS), then Agricultural and Engineering Sciences (CAIM) account for 20% of the cases, while Natural Sciences (CEN) account only 12% - much less represented are the Social Sciences and Humanities (CSH) with only represent 4%. This trend is also observed in the qualitative analysis carried out in the study based on interviews and focus groups with researchers, exploring the publication styles and disciplines most affected by APC payments. These interviews show that Biological and Health Sciences are the most inclined towards gold open access and there are very few diamond journals in the first JCR quartile. To address this problem, an international working group was formed by mid-2023 between CONICET, the Centre national de la recherche scientifique (CNRS) and the University of Sao Paulo, whose objective is to generate a diamond journal or platform of diamond journals from Argentina, France and Brazil in the areas of medicine, biological and health sciences.

All these specific studies of the Agencia funds that served as basis for the Guidelines were edited and published in a collective volume (Terlizzi & Zukerfeld 2023). Another fundamental source was the Diagnosis and guidelines for an open science policy in Argentina, produced by the Advisory Committee on Open and Citizen Science of the Ministry of Science, Technology and Innovation. The Agencia I+D+i, through the Intangible Assets and Intellectual Property Unit (UAIyPI), participated in the committee and the preparation of this document. Particularly noticeable is the recommendation that "in addition to guaranteeing access to scientific information generated with public funds, seeks to ensure that institutions and organizations take responsibility and ownership (in the best sense of the word) of the knowledge they generate and consequently manage and disseminate it. Full compliance with this regulation would prevent the privatization of publicly funded knowledge and discourage the need to pay a ransom to access it (either by paying subscriptions or by paying APCs)" (Comité Asesor en Ciencia Abierta y Ciudadana 2022: 20).

Finally, the other input carried out by the Agencia I+D+i were several meetings with researchers and other relevant actors in the SNCTI to discuss the issue of open access and APCs and to find common positions. In the first meeting it became clear that for some disciplines it is vital to participate in certain publication circuits, but that such participation can also be very costly. This means that it is necessary to establish common agendas, set up a collaborative network and seek consensus at the national level as well as creating editorial maps of open access journals and reinforcing the option for scientific quality journals instead of costly rapid peer review or commercial publishers. In short, the Agency aimed, in the long term, to promote not-for-profit open access publishing, whether in the form of institutional repositories (green route) or gratuitous open access journals from academic publishers and scientific societies (diamond route). In the short term, the Agency attempted to contribute to non-commercial publishing while enhancing the international visibility of the research/researchers.

CONCLUSIONS AND POLICY REMARKS

Based on all the above inputs, three axes became critical for building alternative paths to counteract the negative effects of open access with APC in a non-hegemonic country such as Argentina:

1. To modify research assessment from the search for "impact and excellence" towards

scientific quality, developing gradual incentives to reward publishing in repositories and diamond access journals as a requisite for final project reports.

2. Promote the support and valuation of diamond access journals and independent society driven journals in those areas most affected by APCs. Examples:

-Development of a list of regional and international journals in diamond access to serve as a basis for guiding the researchers' choice and to reward them in the process of evaluation of fundable projects.

-Funding national open access journals willing to make a transition to diamond model.

3. To carry out efficient negotiation processes with scientific publishers in order to guarantee the compliance with Law 26.899 and the commitments established in the research project contracts. An assessment of the experience of transformative agreements in different LA countries can be useful to extract experience for those national negotiations.

4. To convene researchers, scientific societies, funders and publishers in a forum to discuss alternatives.

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