

Academic Publishing: Research Leadership in the Context of Digitalization and Globalization of the Business Environment

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Abstract: *The aim of the present study is to recreate the new role that academic publishing houses perform in the conditions of digital transformation and the growing number and volume of scientific publications in the conditions of oligopolistic competition, of structuring the ecosystem of academic publishing as an opportunity to build a network of mutually intersecting interests. The chosen approach analyzes the dynamic environment in which academic publishing houses function under the influence of subsequent crises and changes in the business model of accumulation and dissemination of scientific knowledge. Bearing in mind the special role of academic publication and distribution, it has a key role in the exchange of scientific knowledge, expanding the possibilities of access and use of already created and distributed scientific production to increase academic institutions' competitiveness. Academic publishing and knowledge dissemination are facing the need for digital transformation and redesign of the access system. Only in such a case will it realize its practical goals of creating added value and return on the resources invested in the system. This change in the role of academic publishing makes it relevant. It strengthens its contribution to limiting the opportunities for abuse of authors' copyright on the results of their scientific research. Academic publishing and distribution form a changing and relatively new field that, in the current market conditions, is tasked with satisfying the interests of universities, researchers and end-users for access to scientific knowledge. The main challenges faced by academic publishing include: the provision of open access to scientific information; the protection of intellectual property; the realization of economic efficiency based on invested resources and increased competitiveness. In the end, academic publishing houses are economic agents, using various funding sources, and hence realize to varying degrees the effect of their improved market positioning. In this way, this industry contributes to the promotion of scientific knowledge and copyright protection for researchers, the possibility of comparisons and new searches, and for investors in the publishing business – to receive a real return for the resources invested. The present study is tasked with giving a new perspective to the business of academic publishing and distribution as a socially significant ecosystem subject to basic economic laws and its role in sharing scientific knowledge to improve the welfare of society.*

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Introduction

Academic publishing took its first steps long enough to leave a lasting mark on human history. Emerging and developing in sync with the university network, academic publishing houses, although at first glance they have a supporting function, are, in fact, an essential prerequisite for developing the market of new knowledge as a whole. The high level of competition between universities in offering educational products is further stimulated by the quality of the educational process, the preparation of graduates, and the potential income after successful implementation based on invested resources in their education. We can see the direct connection between investment and return, rent – some purely economic concepts related to investment efficiency - concepts that at first glance are indirectly related to the object of this study.

Similar pressure was put on academic publishing in the conditions of a pandemic when platform learning was widely used, and the distribution of scientific materials was realized only in a digital environment. Significant difficulties have been experienced by those higher education institutions that still need to develop and apply distance learning in their practice. Conventional access to university libraries and bookstores has also proved limited. This new challenge has challenged academic publishers to digitize the process of creating, distributing and securing academic literature to ensure access to interested audiences. Examining academic publishing as “business as usual” subject to basic market laws is one of the main aims of this research. The supply and demand laws, market forces' workings, government regulations, and intellectual property protection affect the academic publishing system and other everyday goods. These fundamental problems, which have their social cost with a significant projection in the future, are the subject of this study.

Methodology and Research Questions

This article aims to conceptualize the role of academic publishing in the general field of the creation, distribution, and consumption of a scientific product in our country. This role has evolved due to competition between universities and changes in the economic environment in which academic publishing houses carry out their tasks. The object of the proposed research is the change in the role and meaning of academic publishing in the context of a dynamically changing environment. From the registration of academic achievements of groups of researchers, academic publishing houses become promoters of scientific production and implement the basic principles of publishing ethics to assist in improving the position of academic institutions in the market of ratings and occupying leadership positions in the taught scientific fields.

For the successful implementation of this task, the method of content analysis, business modeling, and statistical analysis was used. During the research, answers to the following research questions are sought:

1. How is the role of academic publishers changing, and what circumstances have caused these changes?
2. What organizational innovations accompany digital transformation, and what are the effects of building a mature digital ecosystem in academic publishing and distribution?

Limiting research studies can be analyzed by place and time. Restrictions regarding the territorial scope are realized in the conditions of the world academic publishing market, and the time interval is from the end of 2019, i.e., the beginning of the pandemic crisis, until now.

Related Publications

Considering the specific object of research, the particular role that academic publishing houses have, and the market in which they participate, a few publications have been devoted to researching the state and behavior of the academic publishing business. Puehringer, S., Rath J., and T. Griesebner (2021)¹ examine the publishing business in detail, basing comments on the main funding avenues for academic publishing, emphasizing public funding. The authors have analyzed the state of the global academic publishing market

¹ Puehringer, S., Rath, J., Griesebner, T. (2021). The political economy of academic publishing: On the commodification of a public good. *PLoS ONE*, 16(6), e0253226. <https://doi.org/10.1371/journal.pone.0253226.g003>

by summarizing the paths to financial independence and efficiency of academic publishing based on submission fees, processing fees, open access fees, etc. Richard Smith (2018)² shares and analyzes the opinions of several academic teachers regarding the role and possibilities of academic publishing houses to ensure a sufficiently diverse and interested audience for the already-created scientific knowledge. He is convinced that wider access to science means better education, higher quality of learning, more innovation, less inequality, better opportunities to solve problems such as glaring inequality, poverty, but explains that since the rise in publishing fees, some of the publishers have made significant profits from it. At the expense of the work of scientists, a limited circle of investors has become significantly richer.

Virginia Barbour (2019)³ has found that the primary concern of publishing research in high-profile journals has become closely related to other concomitant commitments, such as academic prestige and incentives for academics and institutions. The author also concludes that publication is an important step towards the flow of money and prestige gained through the academic education system. According to her idea, unfortunately, the system organized in this way is not structured by the people with the strongest interests in it but by those who stand at its entrance and benefit by directly controlling access to it through publishing fees.

Tennant, J.P., Waldner, F., Jacques, D.C., et al. (2016)⁴ in their research, they analyze the role of open access to the publications of academic publications and share the idea of the presence of pros and cons of open access in “three main areas – academic, economic and public”. The authors share the benefits for researchers (citation, non-academic access), for economists (with value for innovative industries, for access to public and private services), for society (providing access to dissemination of achievements of scientists from relatively low-middle-income countries). All this, however, ultimately leads to reduced financial pressure in the management of academic publishing. The authors give a definition of open access, as well as the historical stages through which it has passed from the emergence of the printing technique to the present moment, a bibliometric measurement of the rates of citation of a study in open access has been made.

T. Trencheva (2013)⁵ in a development funded by the Scientific Research Fund analyzes the principles of open access, the main trends Green Road and Golden Road. The author's contribution is the results of the practical-applied research of the share of Bulgarian journals presented in DOAJ – the most popular international platform for open access.

On the Special Role of Academic Publishing

The analysis of the processes of the world market of academic publishing shows that, despite the complex processes of merging and swarming of university publishing houses, the number of published books and journals is constantly growing, and the pandemic situation further stimulates the work on research and publications. Academic autonomy does not guarantee a fixed share of the higher school's budget for literature (which tends to decrease in a global aspect, the state support policy (for now in Bulgaria expressed only by exemption from VAT)⁶ has abdicated its important role in building the scientific horizon and scientific profile of the nation. In some industries, tough economic times may have fueled fierce competition and large-scale price adjustments. However, academic publishing does not operate according to the rules of a conventional, free asset market. Unlike most traded goods, academic journals and books are unique in their content and character and cannot be replaced by cheaper alternatives. A book published by an academic publisher may not sell as a bestseller, but at the same time it can bring significant income to the author's collective and to the publisher who agreed to distribute it if it is in a popular scientific field of interest to a significant scientific audience or is a teaching aid developed by a group of experts and used in a teaching process at multiple universities. University libraries and their specialized readerships cannot choose between goods with equivalent consumer qualities and have almost no opportunity to take a leadership position in the process of negotiation at the stages of the publishing process and distribution, because publishers appear in a specific kind of market, distinct from relative lack of real competition to market better-priced analogues or duplicate goods.

² Smith, R. (2018). The business of academic publishing: “a catastrophe”. *The Lancet*, 392(10154), 1186-1187. [https://doi.org/10.1016/S0140-6736\(18\)32353-5](https://doi.org/10.1016/S0140-6736(18)32353-5)

³ Barbour, V. (2019). The future of academic publishing: disruption, opportunity, and a new ecosystem. *Med J Aust*, 211(4). 151-152.e1. doi: 10.5694/mja2.50265

⁴ Tennant JP, Waldner F, Jacques DC et al. (2016). The academic, economic and societal impacts of Open Access: an evidence-based review [version 3; peer review: 4 approved, 1 approved with reservations]. F1000Research. <https://doi.org/10.12688/f1000research.8460.3>

⁵ Trencheva, T. (2013). Open access to scientific information. Sofia, 204 p., with illustration. ISBN 978-954-2946-85-4; [Electronic resource] ISBN 978-954-2946-86-1

⁶ Value Added Tax Law, <https://www.lex.bg/laws/ldoc/2135533201>

The universal digital transformation has realized an unexpected change in the structure of the costs inherent in academic publishing – excluding the costs of paper, chemical inks and costs of human labor for typing and editing text. As a result of the digital transformation, the resources for managing a digital platform or cloud space, which are intangible in nature, but in turn minimize the marginal material costs, appear as fixed costs for academic publishing houses. Qualitative and quantitative changes in the publishing ecosystem have occurred as a result of both the series of crises that have caused the shrinking of library budgets as the main consumers of ecosystem products on the one hand, and the concentration of the academic publishing market on the other, as argued by V. Larivière, S. Haustein and P. Mongeon (2015)⁷, and an increase in the market shares of major players at the expense of those leaving this market as a result of financial shocks. These considerations could be used as a guideline for future research in a relatively unexplored and methodologically unknown activity such as academic publishing.

According to LSE Impact block (2020)⁸, The DOAJ platform includes 9,879 non-APC open access journals worldwide: 2,449 of which are in Latin America; but 4168 in Eastern and Western Europe; 2,794 in Asia; 560 in North America. Of these, more than half (61%) are publications of research institutions owned or under the direction of professional associations or universities. According to the authors of the blog, the goal of academic publishing has always been to establish connections, contacts between researchers from many countries for dialogue, discussions, and the stimulation of scientific research aimed exclusively at improving the quality of human life. Monolingualism in a global academic ecosystem has its positives for exchanging scientific information. Publishing in multiple languages and giving a platform to local research is essential to creating a comprehensive, multifaceted “global knowledge ecosystem and embedding knowledge in local contexts and communities where it can be used”.

The academic publishing ecosystem includes a limited number of participants who are connected and interact based on their interests and within legal constraints. Each of the units of the ecosystem (Table 1) shows a strong connection and dependence with the other units in terms of financing, dissemination and access to academic knowledge, the realization of the expected effects, achievement of social return on the costs of the society on the offer of educational and scientific products.

Table 1. The Academics Publishing Ecosystem

Ecosystem Academics Publishing	Key Challenges and Opportunities
Funding Agency	Subscriptions fee, Individual Article Processing Charges,
Academics Publishing houses	Profit, Impact, prestige, access,
Universities	Scientifics impact, Potency, Free Accesses, Funding
Scientific Society	Scientific Impact, Funding, Investment in publishing Expenditure, Open Access,
Government – Ministry of Education	Tax benefits Funding
Researchers	Open access, increased academic influence, citation opportunities, contacts with other members of the research community, familiarization with the latest advances in the scientific field
Libraries	limited funding sources,

Source: Compiled by the author

Is it possible to balance the interests of the participants in the academic publishing ecosystem and realize positives for each unit? On the one said, university professors and academic researchers are represented, for whom it is essential to have the results of their research published to maintain their growth rates by going through a competitive procedure when the institution they work for offers them such an opportunity. While working on their research and publications, they should have access to related research to support, compare or contrast their ideas to build on their knowledge of already peer-reviewed, evaluated, and published works in the relevant scientific field. University faculty rely on the library to provide these sources, most often through subscription or article requests (a different kind of expense, from my understanding). They get their sources, write their articles, and publish them in any journal they can be accepted to.

On the other said, an essential part of the academic publishing ecosystem is the distributors of journals and periodicals. They are market participants; they have made legal deals to own or distribute these magazines

⁷ Larivière, V., Haustein, S., Mongeon, P. (2015). The Oligopoly of Academic Publishers in the Digital Era. *PLoS ONE*, 10(6), e0127502. doi:10.1371/journal.pone.0127502

⁸<https://blogs.lse.ac.uk/impactofsocialsciences/2020/05/20/the-commercial-model-of-academic-publishing-underscoring-plan-s-weakens-the-existing-open-access-ecosystem-in-latin-america/>

and have invested in copyright. These intermediaries, by their role, aim to sell their subscriptions to the largest number of institutions both for basic revenue reasons and for supporting and building a generation of young scientists. The more subscribers the print or electronic forms reach, the greater the opportunity for them to become recognizable and be cited. A higher number of citations means that over time it will be in greater demand, potentially leading to more potential future and, ultimately existing subscriptions. Their liaison with the library is critical in obtaining the information and published data for faculty access.

Academic units need journals for both research and publication to improve recognition among specialist academic audiences; journals are looking for people to submit their articles, subscribe to their content, and enhance the academic reputation of their research holdings. Each participant in the ecosystem is satisfied because the interests are balanced, and the costs are shared and equidistant from its center. The relatively equal distance of the interests of all participants predetermines and the level of satisfaction is a prerequisite for creating a relatively balanced scientific ecosystem. Real change can be achieved in any ecosystem if one of its constituent variables is changed. Such is permissible and possible if, for example, subscription prices are changed or exclusive conditions are reached in distribution deals, or access restrictions are filtered or removed, or license agreements are signed, the terms of which do not correspond to the nature of scientific research. Each of these small steps leads to a convergence of the goals set by the two parties in the academic publishing process – the academic publishing houses and the academic scientific community.

Academics Publishing – Business as Usual

The academic publishing industry has a relatively standard technological cycle that covers the movement of newly created knowledge from the moment of its generation to the provision of access for use by a specific user. It is in this technological process that academic publishers as economic agents realize added value by rationalizing their cost centers. The possibility of growth in turnover and added value in such an extreme way lies in the specific characteristics of the economics of academic publishing. Unlike regular vendors, authors provide their goods without financial compensation, and consumers (i.e., readers) find themselves isolated in the sales process. Because purchase and use are not directly related, price movements cannot realize a direct relationship with demand. The specificity of the final product – scientific knowledge in the form of a scientific article, on which the scientific publication has a monopoly – provides an additional stimulus to the growth of the added value. This monopoly is accompanied by the unique nature of each study, which in its originality cannot be replaced by any other article published in an alternative academic publication. The standard diffusion of new knowledge as an object of academic publishing goes through a relatively conventional technological cycle, in the process of which additional intellectual value is “added”:

- Generation of an empirical data base.
- Preparation and development of the scientific research manuscript.
- Reviewing the manuscript for expert opinion.
- Reflecting the notes made in the review.
- Payment of the announced license fee.
- Announcing the completed research in the contents of a journal and providing access to it.
- The author or the university library pays the academic publisher for providing access.

Here we will note the lack of payment for the invested labor and time on the part of the researcher. However, one can discuss the simultaneous transfer of copyright from the researchers to the publishers, simultaneously with the payment of a publication fee, i.e., a glaring disparity of the effects of using the created added value of the two countries. It is hardly a surprise that there is a movement towards open access; it is a natural reaction to a change in the scientific environment. The digital transformation of business is emerging as a dominant technology in the global publishing market as a format that has taken over 89% of publications in the scientific and technical segment in 2020, and this represents a 10% increase compared to 2019. Digitized, according to the Association, in general is 77% of the global market in 2020 and 82% in 2021.

According to The Association of Scientific Technical and Medical Publishers (STM),⁹ which has over 140 academic publishers from more than 20 countries on all continents as members, the COVID pandemic has caused a contraction of the academic publishing market has shrunk to a volume of USD 26.5 billion by -5% as a result of the global pandemic predicts a recovery from pre-pandemic (2019) worth USD 28 billion by 2023.

⁹ STM Global Brief (2021). Economics & Market Size.

According to Delta Think¹⁰ in 2019, the revenue of academic publications from the sale of open access reached USD 760 million, that is, a growth of 13% compared to the level in 2018. They also estimate that they expected sales to grow to about USD 850 million .in 2020. Just over 30% of all scientific articles are published as paid open access, representing just over 7% of the total market value for journal publishing. Delta Think have made a forecast for the period from 2019-2022 that the capitalized annual growth rate of revenue will have a share of over 12.5% in open access and 11.5% growth in the market value of open access publications. As the Graff. № 1 presents the distribution of academic publications by country of origin with a predominant share in 2020. From the graph, it can be concluded that the share of publications from Great Britain, the United States of America, the Netherlands and Germany is predominant. According to STM ¹¹ the number of new English-language peer-reviewed scientific journals on the Ulrich's Web platform are also constantly growing. From 24,552 in 2001, they reached 34,809 in 2010 and 46,736 in 2020.

This information is also of secondary importance to the ranking of the universities in the international ranking, where the universities with professors, authors of the most publications and the most citations in first-class databases and scientific journals in Q1-Q4 are at the top. In the first ten are 3 universities from Great Britain and 7 from the USA. Only in the next ten are universities from Switzerland, China, and Singapore. One of the not-so-common indicators of ranking in this ranking is the number of foreign students studying at these universities. The high rank is also a guarantee of high quality and evaluates the investment in training in an educational program at these universities. The academic publishing and distribution industry is also directly involved in the formation of the price of the educational product of the higher education system, i.e., “sells” university programs. Hence the important social role of this industry, realized through access to an educational product of the highest quality.

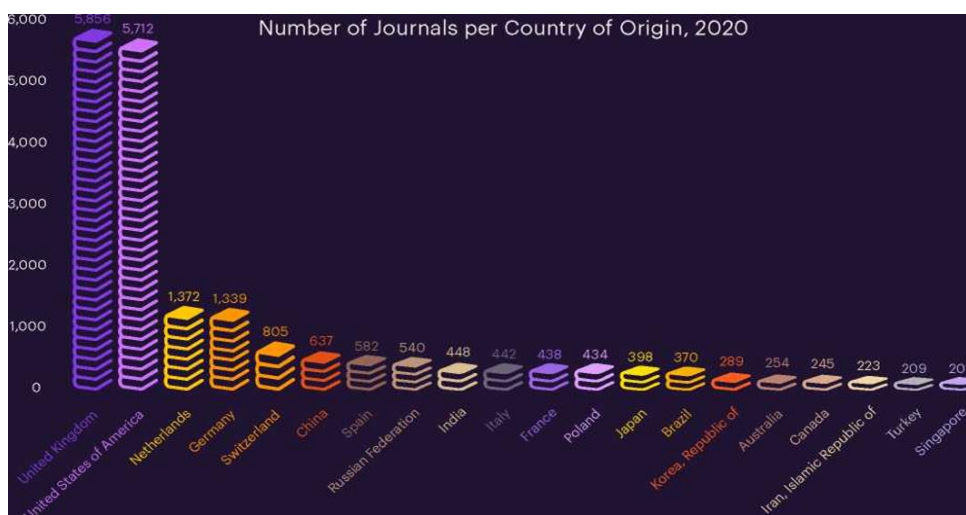


Figure 1. Numbers of Journals per Country 2020

Source: STM Global Brief 2021. Economics & Market Size

Table № 2 presents quantitative characteristics of two of the main competitors in the academic publishing and distribution market. The data shows systematic revenue cash flows, good after-tax financial results that rival e-commerce platforms such as Amazon and others whose financial results are well known to the public.

Table 2. Financial Performance of Representative Agents of the Publishing Academic Business

Springer Nature	Elsevier's
More than “€300 million (US\$293.7 million) invested in technology to improve and speed up the publishing experience, ensure research integrity is protected, and misinformation is tackled, €120 million in 2021 alone (US\$117.5 million)	Revenue £7,244m (£7,110m in 2020), underlying growth +7%
More than 2.6 billion in total in 2021, up more than 10% over 2020	Adjusted operating profit £2,210m (£2,076m in 2020), underlying growth +13%
Increased investment to accelerate solutions to world challenges—more than €18 million (US\$17.6 million) waived in article processing fees in 2021 for researchers in financial need	Adjusted profit before tax £2,077m (£1,916m in 2020), constant currency growth +15%

¹⁰ Michael and Pollock (2020). News & Views: Open Access Market Sizing Update.

¹¹ STM analysis of Ulrich’s Web data, September 2021.

Table 2 (cont.). Financial Performance of Representative Agents of the Publishing Academic Business

Increased investment for Springer Nature with an additional €5 million US\$4.9 million) invested in staff training and development, along with an expanded diversity, equality, and inclusion programs, data collection for better progress monitoring, and new employee networks. ¹²	Reported operating profit £1,884m (£1,525m in 2020)
	Reported profit before tax £1,797m (£1,483m in 2020)
	Adjusted Earnings per share 87.6 p (80.1 in 2020), constant currency growth +17%
	Proposed full year dividend 49.8 p (47.0 p in 2020) +6% ¹³

Source: Compiled by the author

Conclusion

This study seeks answers to the questions related to the future of the academic publishing industry due to the important role it plays in the dissemination and exchange of scientific knowledge, in improving the innovativeness of scientific research, the added value that is created and the need to conduct state policy to support a relatively underfunded area, such as the creation, production and distribution of scientific publications. Will it create a dampening effect on the pace of academic research, thereby depriving these journals of the quantity and quality of research that researchers need to continue their work and advance their scientific careers? Will the university seek alternatives that challenge the traditional scientific order and work to provide open access or shared research consortia? How much can each country afford to give to continue their respective work? These are all questions to which every society, every nation must seek answers, because investments in scientific research are a prerequisite for the development of high-tech productions with high added value for society. From considering this very important connection between the system of higher education and the industry of academic publishing and distribution is the possibility of promoting the conduct of state policy in this area. The creation of a single platform for all academic publishing houses within a national system of higher education, organized, financed and supported with resources of the state in the person of the Ministry of Education and Science, is an opportunity to increase the competitiveness of the national educational market, to present, increase the influence and demand for an educational product as an opportunity for a rational investment with high added value and as the implementation of effective cooperation in an ecosystem.

Table 3. The Most Popular Academics Publishing Houses

No	Most famous academics publishing	Sciences 'area Description
1	Academic Press	Imprint in Elsevier
2	Allen Press	It is intended for dentists, residents, students, and other health professionals and nurse anesthetists interested in dental anesthesiology
3	Begell House	Engineering, biomedical science
4	Bentham Science	Medical Science, Engineering
5	Cambridge University Press	More than 380 peer-reviewed academics journals, covering subject across Humanity, Social Sciences, technology and medicine
6	Elsevier	Science, Economy, Arts and Humanities, Life and Health Sciences, Social Sciences
7	Emerald Group Publishing	Business, Engineering, Health, Management, Sociology, Tourism, Education, Library and Information Study
8	Equinox Publishing	Science Technology, Medicine, Social Sciences
9	Guilford Press	Psychology and Psychiatry, Public Health, Social Criticism
10	Hindawi Publishing	Science, Technology, Medicine, Social Sciences
11	Hogrefe	Psychology, Psychiatry, Medicine, Nursing
12	John Wiley&Sons: Wiley Online	Medical Science, Engineering, Humanities, Social Sciences, History, Criminal Justice
13	Oxford Academic	Arts and Humanities, Law, Medicine, Health, Science & Mathematics, Social Sciences
14	Springer	Life and Physical Science, Technology % Environment, Economics, Medicine, Philosophy, Public Health, Social Science Law
15	Taylor & Francis	Arts and Humanities, Behavioral, Physical and Social Sciences, Health, Sport and Leisure, Tourism, Law, Language & Literature

Sources: Author's investigations

¹² Unlocking potential (2021). SUSTAINABLE BUSINESS REPORT. <https://sustainablebusiness.springernature.com/2021/>

¹³ Elsevier's 2021 financial results. <https://www.uksg.org/newsletter/uksg-enews-509/reed-elseviers-2021-financial-results>

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